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REPORT AND COMMENTS ON THE EYEBALL INJURIES BY IRON FOREIGN BODIES AT THE NEW YORK OPHTHALMIC AND AURAL INSTITUTE, NEW YORK CITY.

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(*Continued from Vol. XXXVI., No. 4, p. 504.*)

C.—FOREIGN BODY SURELY IN THE INTERIOR BUT NOT LOCALIZED BY THE MAGNET. ENUCLEATION BROUGHT EVIDENCE.

CASE 21. **Piece of steel entered eye near sclero-corneal junction. Irido-choroiditis two days later. Small and large magnets failed, though wound was enlarged and new scleral section made. Enucleation. Foreign body had left globe through sclera near optic nerve. Had not been found.**

H. R. Reedy, æt. thirty-five, Berwick, Pa. Left eye struck by piece of steel two days ago. Sclera pierced just outside corneal margin on nasal side. Sight immediately lost; pain. Admitted August 26, 1899. Slight œdema of upper lid, intense ciliary injection, moderate chemosis, pupil round but occupied by spongy exudation. From fundus a yellowish reflex obtainable, slight hypopyon, light-perception. The following day symptoms increased, pupil dilated by atropin, spongy material seen upon anterior capsule, hypopyon gone. Yellow fundus-reflex same. Operation. Large magnet resultless, hand

magnet failed in locating the foreign body. Permission obtained by patient for enucleation, if thought advisable. Under ether the original wound enlarged; trial of magnet unsuccessful. Incision in sclera between inferior and externus recti muscles; pus immediately escaped with vitreous. Tip of small magnet inserted into vitreous cavity failed to locate the foreign body. Enucleation.

Eyeball after removal was divided by an equatorial section. Purulent cyclitis, vitreous streaked with pus. Just to outer side of optic nerve is a small opening which had partly closed and which is evidently wound of exit of foreign body. Wound of conjunctiva healed well. Discharged September 2d.

Case 52. **Piece of steel in eye during last eleven years. Periodical inflammation. Corneal scar. Opening in iris. Amaurosis. Magnet trial resultless. Enucleation. Foreign body found encapsulated.**

George Weissmann, æt. twenty-four, of Union, N. Y. Admitted December 15, 1902. Right eye pierced by a chip of steel eleven years ago. Eye quieted soon but became inflamed at times. Recent inflammation set in two weeks ago with severe pain. Cornea dull, circumcorneal injection, pupil closed, iris brownish discolored, no fundus-reflex. Small hole in the upper and nasal quadrant of the iris. No pain experienced, when approached to the magnet. Amaurosis for years. After unsuccessful trial with magnet the eye was enucleated. Recovery endangered by an attack of religious mania, but normal otherwise.

Piece of steel found encapsulated all around but small corner towards the vitreous chamber, lying in retina of posterior half of the globe. Symptoms of chronic irido-cyclitis and retinitis, lens absorbed, capsule thickened. Vitreous clear.

Case 3. **Chip of steel entered through cornea, pupil, and lens, not indicated by magnet. Enucleation. Small piece stuck in sclera near optic nerve.**

Case 4. **Piece of nail in eye for eighteen years. Eye quiet, some sight left. Then irido-cyclitis. Hypopyon 2mm in height. Siderosis. Examination with large magnet negative. Enucleation. Globe adhered to magnet at lower part.**

Case 5. **Subacute purulent irido-choroiditis from chip of iron in eye, not indicated by magnet. Enucleation. Globe attracted by magnet after enucleation.**

D.—FOREIGN BODIES ARE EVIDENCED BY MAGNET, EXTRACTION FAILED; THEY ARE SHOWN AFTER ENUCLEATION.

Case 47. **Piece of steel in eye for a week. Spongy iritis, chemosis. Magnet indicated iron but failed to extract it. Enucleation. Foreign body found.**

Mathias Riegel, æt. eight, Brooklyn. Admitted October 22, 1902. Right eye struck by something while playing with a hammer one week ago. Minute movement of sideroscope when approached to temporal and upper portion of the eye; pain experienced at the spot mentioned. Cornea and anterior chamber dull, spongy iritis, chemosis. Small wound of nasal part of cornea, lens clear, vitreous dull. October 23d, symptoms of inflammation increased; the next day enucleation was performed. Section through the globe showed abscess in vitreous and piece of steel in the anterior part of the globe.

The next two cases are made remarkable by the lodging of pieces of steel in the optic nerve entering through the globe.

Case 50. **Chip of steel entered through cornea, iris, and lens. In repeated attempts magnet failed in extracting. Linear extraction of cataract, irido-cyclitis, hypopyon, panophthalmitis. Exophthalmus. Enucleation. Foreign body found sticking in optic nerve.**

John D. Curry, æt. thirty-one, Stamford, Conn. Admitted November 13, 1903. Piece of steel in left eye for some days. Wound of upper and nasal portion of cornea, wound in iris, lens opaque and swollen. Sideroscope not reacting. Magnet failed to indicate a foreign body during first two days; some pain was felt the third day. Light-perception but no orientation. Increasing chemosis and œdema of the lids, conjunctival suggillation. Swollen cataract raised tension; pilocarpin instilled and, November 20th, linear extraction of cataract performed. Relief for some days. A week after extraction of cataract hypopyon formed, scar being free from

infection. Irritation augmented during next week, +T and pain especially during night. December 6th, perception of light gone. December 8th, after patient suffered from steady pain during the last two nights, enucleation performed. Difficulty on account of infiltration of Tenon's capsule and its adhesion to globe. On attempt to cut through optic nerve, hard substance was felt between the scissors. Nerve cut farther away from eyeball.

After enucleation a large piece of steel was found sticking in the optic nerve.

After removal of the eye patient recovered soon and left the hospital December 15th.

The classes C and D comprise seven cases; the presence of the foreign body in the interior of the eye had been suspected, but the magnet failed to extract it. They were found in all cases but one, in which the chip of steel left the globe after passing through it and was lost in the orbit (Case 21). The wound of exit was found near the optic nerve. Cases 3 and 50 are similar. In the former the foreign body stuck in the sclera near the optic nerve, in the latter it was held in the tissue of the nerve itself.

Case 52 is one of the kind, where a piece of steel had been tolerated in the interior of the eye for a long period, 11 years, causing but temporary irritation and no sympathetic ophthalmia. Enucleation however proved a necessity when a recent irritation persisted for over two weeks and after magnet had failed. This case demonstrates that Dr. Knapp is right in saying, that chips of steel remaining in an eye "cannot be trusted." A very interesting case of this class, cured by Dr. Gelpke, will be mentioned later. The following group will show six cases of that doubtful kind.

FOURTH GROUP: IRON FOREIGN BODIES SUSPECTED IN THE EYE, BUT EXAMINATION WITH THE MAGNET WAS NEGATIVE. RECOVERY UNDER EXPECTANT TREATMENT. SUCH CASES OUGHT TO BE EXAMINED BY THE X-RAY.

Case 29. **Several particles of "rust" removed from cornea. Patient discharged, his eye being free from irritation. He returned eighteen months later with siderosis of a quiet eye. Sight slightly diminished. Iron indicated by sideroscope.**

Herman Kunning, æt. twenty-seven, engineer on S. S. *Breslau* of North German Lloyd, was admitted January 26, 1901. Some small particles of iron were removed from surface of cornea and patient was discharged January 30, 1901. He came back October 23, 1902, with the following statement: Returning to Germany on February 18, 1901, his eye was red again and he consulted an oculist in Bremen, Dr. Thiercotter, who stated eye was normal in function and appearance. V = $\frac{20}{20}$, small scar near cornea. He has seen patient again July 26, 1902; eye free from irritation, Tn., no tenderness upon touch, iris discolored (siderosis), pupil reacted promptly. V = $\frac{1}{2}$. After dilating the pupil with atropin, rust-red specks showed upon the periphery of the anterior capsule in a circular arrangement. Small scar in anterior and another one in posterior capsule. Presence of a chip of iron was suspected in the interior. Sideroscope in fact showed minute movement. No foreign body discovered by ophthalmoscope. October 23, 1903, there was found the same condition, but sight was rather less: $\frac{20}{60}$.

Case 31. **Chip of iron had entered eye four days previous to admission, scar of cornea, cataract, light-perception. Foreign body not found. Linear extraction. Recovery.**

John Weinhold, æt. twenty-three, Brooklyn, was admitted on March 15, 1901, four days after chip of steel had struck his right eye. Light-perception good; corneal wound, cataract. Had no pain when brought near to magnet, and trials were not repeated. Anterior chamber in process of restoration the day after admission, pupil dilated with atropin. April 17th, lens-matter was partially removed by linear extraction, and eye was free from irritation, when patient left on April 24, 1901.

Case 33. **Chip of steel entered eye through cornea, intraocular hemorrhage. Magnet negative. Recovery.**

Henry Henie, æt. sixty, Hoboken. Four hours previous to admission on June 5, 1901, a piece of steel entered lower

and nasal quadrant of cornea of left eye. Iris adherent to wound. Blood in anterior chamber and apparently in vitreous chamber; no fundus-reflex. Attempt to remove foreign body by magnet proved a failure. Wound freed from impacted iris. Attempts with magnet were repeated but were unsuccessful. Eye quiet, can count fingers. Discharged June 13, 1901.

Case 45. **Wound of cornea, iris, lens. Neither sideroscope nor Haab's magnet gave evidence of presence of piece of steel.**

Frank Demarest, æt. twenty-one, Montclair, N. J. Admitted July 22, 1902. Right eye struck this morning by chips of steel. Corneal wound, tear across temporal side of iris, slight opacity across the lens or through it, otherwise media clear. Sideroscope showed no movement and Haab's magnet did not elicit pain. The eye not being irritated patient was discharged July 24th.

Case 18. **Corneal wound, prolapse of iris. Repeated trials by magnet unsuccessful. Eye quiet. Cataract.**

John Downes, æt. twenty-three, Jersey City. Came June 20, 1899, a few hours after his right eye had been struck by a piece of iron. Large vertical wound of cornea involving almost its entire width, prolapse of iris at lower portion of the wound, lens-matter and some vitreous poured out. Magnet tried unsuccessfully for three days. Wound cleansed and prolapse cut off the first day. Patient left the hospital June 23d, his eye being in good condition, wound closed, no irritation.

Case 28. **Piece of steel in eye, quiet for two years. Some irritation. Magnet negative. Eye quiet after a few days.**

H. R. Hohler, æt. forty-eight, of Hoboken, had had a piece of steel in his eye for two years, when admitted January 12, 1901. Eye inflamed for last few days. No circumcorneal injection, foreign body not seen in vitreous. When put near the magnet the patient felt distinct pain in a certain location, but magnet failed to locate the chip at first. When pain was felt repeatedly at the same spot, sclera was incised and magnet applied again in vain. Scleral wound healed promptly and eye became free from irritation after a few days. Discharged June 16th.

Case 65. **Piece of steel had entered the eye nine days previous**

to admission. Corneal wound, cataract, light-perception. Not indicated by sideroscope or magnet. Eye quiet.

Clarence Arnett, æt. nineteen, Corning, N. Y., was admitted May 18, 1904. Nine days previously a piece of steel had entered the right eye. Corneal wound downward and temporally with a small particle of lens-matter in it. Conjunctival and slight circumcorneal congestion. No injury of iris visible, pupil fairly round and half dilated, iris congested, at the bottom of the anterior chamber small sediment, which seems to be a hypopyon. Mass of opaque lens downward, no fundus-reflex. Faint perception of light. When put near the magnet, the infero-temporal quadrant of the iris seemed to bulge at first and patient said he felt pain. Upon repeated attempts, however, no bulging was seen and no pain was felt. The following day magnet was applied without success. Congestion and sediment at the bottom of the anterior chamber not being increased and eye being free from pain, patient was discharged May 19, 1904. May 23d, wound was healed and only slightly congested. $V = \frac{4}{200}$.

Of this group the first case (29) represents an example of those "not to be trusted." The eye is quiet and free from attacks of irritation, as was the experience in Case 52, but the sight decreased gradually. At the same time siderosis developed; the iris was discolored, and rust-red specks were seen upon the anterior capsule—deposits of iron-pigment. Though the presence of iron in the vitreous was indicated by the sideroscope, it was thought safer to leave the eye alone as long as there was no urgent reason for extracting the iron by the magnet.

Another eye in which trouble may arise some day from the chips of iron in the vitreous is that of Case 28. The foreign body did not excite congestion until two years after it had entered. The irritation, when patient presented himself, was not of a serious nature, but the magnet indicated iron by eliciting pain at a certain spot of the sclera. An incision was made there and the tip of Haab's magnet brought in close contact. No result.

The eye becoming free from congestion after a few days, no further trials were made with the magnet. The eyes of the remaining five cases of this group seem thus far to tolerate the foreign body in the interior.

In closing the report of the cases a few more might be added, which came for treatment to the New York Ophthalmic and Aural Institute, but they were not counted.

First. One of the patients, G. McCard, æt. forty-nine, of Albany, was hurt by a chip of iron on his left eye four days previous to his admission on January 16, 1904. Small scar in cornea, iris ruptured, lens partially opaque, fundus indistinct. Large magnet when applied at a spot *6mm* below and toward nasal side of corneal margin produced pain repeatedly. Unfortunately patient refused corneal incision and left the hospital.

Second. Another man, Th. Chas. Thins, æt. twenty-seven, Bayonne, N. J., came January 20, 1904. The left eye was struck by a piece of steel ten hours previously. Wound of cornea, lens opaque. When Haab's magnet gave no evidence of foreign body at the first attempt, the patient refused to undergo another trial and left. Four cases could not be used for want of a sufficient history.

Third. John Roth, æt. thirty-six, Brooklyn, came July 25, 1899. "Iron-rust" flew into his right eye six weeks ago. Had purulent iritis. Enucleation. Not stated whether magnet had been tried, or not.

Fourth. Chas. Campbell, æt. twenty-seven, of Brooklyn, was admitted March 20, 1901. A week ago a piece of steel had entered through cornea of right eye. Iridectomy made and by Haab's magnet was extracted a piece of steel 1 x *2mm* in diameter, thin and sharp-pointed at one end. No further statement. Discharged March 26, 1901.

Fifth. J. McCormick, æt. forty-six, New York. Admitted November 28, 1900, with "foreign body in left eye." Nothing further stated than that iris was in the corneal wound, pus in anterior chamber, light-perception good. Prolapse of iris cut off; anterior chamber cleared gradually.

Sixth. Chr. S. Morris, æt. forty-five, Brooklyn, admitted

August 18, 1900. Perforating wound of lower lid and sclera. Both the large and small magnets failed. No history. Discharged August 30, 1900.

The results obtained in all the 66 cases, not counting the last six with insufficient history, were as follows:

The foreign body was extracted in 51 cases; of which afterwards the eye was enucleated 4 times and preserved 47 times. The foreign body was found after the enucleation 8 times, was not found, but eyes quiet 11 times—a total of 70.

Enucleation had to be performed in 12 cases, or in 18%. Four times the foreign body had been extracted successfully, but it had been infected and panophthalmitis ruined the eyes (Cases 9, 63, 62, 55). Eight times the foreign body was found after the enucleation. It had not caused any reaction of the magnet 6 times; in one case (36) it had been seen with the ophthalmoscope, in one case (47) the magnet indicated the steel, but failed to extract it. In 11 more cases (Group IV and 6, 24, 43, 58) the magnet was applied unsuccessfully, but the patients were discharged with an eye free from irritation and several had even good sight.

The results as regards useful vision are as follows; Normal, or satisfactory, sight was obtained in 11 cases ($V=\frac{20}{20}$ to $\frac{20}{60}$); and in 3 cases $V=\frac{20}{60}$ to $\frac{20}{200}$, in 5 cases $V=\frac{18}{200}$ to $\frac{8}{200}$, in 14 cases $V=\frac{7}{200}$ to $\frac{3}{200}$, in 11 cases light-perception.

Many of those patients however had favorable prospects of improvement of their sight after the extraction of a cataract or absorption of a hemorrhage. In five cases the eye was saved, but the sight had gone. In four cases the foreign body had been seen lying in the interior of the eye, but was not extracted. The eyes remained free from irritation and the sight was $\frac{20}{30}$, $\frac{15}{200}$, $\frac{12}{200}$, and in one mere light-perception.

See the table subjoined.

Group.	Good result. Foreign body extracted. Good vision.	F. b. extracted. Light perception or V=8/200.	F. B. extracted. V=o. Shape of the eye preserved.	F. b. not found. Eye quiet. Vision.	Enucleation.	Total.
1 A	34 =Vn					
	59 =Vn					
B	37 =Vn					
Total	3					3
2 A	16 =20/70, =20/30		2 (enucleation not permitted)			
B	57 =18/200					
	18 =20/30	13 =P.L.		6 =P.L.	63	
C	60 =20/40	25 =2/200				
Total	5	2	1	1	1	10
3 A	41 =20/50	20 =P.L.22		24 =20/20	36	
		35 38		43 =12/20	(not	
				58 = 15/200	found)	
B	27 =20/200	14, 15, 17	19, 30, 32		55, 62	
	42 =20/30	23, 26			9	
	44 =20/20	39, 40, 49				
	48 =20/200	51, 53				
	56 =15/200	54, 46, 64				
	61 =8/200	66				
	7 =20/20	10, 11, 12				
C					21, 52	
D					3, 4, 5	
					47, 50	
Total	8	21	3	3	11	46
4	29 =20/50	31, 33, 45				
		18, 65	28			
	1	5	1			7
	17	28	5	4	12	66

Since Dr. Knapp's publication of the first 13 cases in his own practice of the removal of iron from the eye with Haab's magnet, a good many papers have been issued concerning that subject and its relative branches; as "on tolerability of iron foreign-bodies in the eye," on siderosis bulbi, and on the value of the different kinds of magnets. The articles with a larger number of cases will be reported as to the success and some of the more interesting cases mentioned.

Dr. A. Barkan, San Francisco, has published in addition to four cases, which have been mentioned by Dr. Knapp, two more papers. One with 7 cases, and the other with 10 more. He obtained 16 recoveries. The foreign body had been located.

In 1 case anteriorly to iris, V = $\frac{20}{30}$; in 1 case behind the iris, V=$\frac{20}{70}$ in 1 case in the iris, V=$\frac{12}{200}$, in 10 cases in the vitreous, V=$\frac{20}{200}$, $\frac{20}{30}$, $\frac{20}{70}$, $\frac{15}{100}$, $\frac{12}{200}$, $\frac{20}{30}$, $\frac{10}{200}$, $\frac{20}{70}$, $\frac{20}{30}$, $\frac{20}{40}$. In 2 cases location was unknown, V=$\frac{5}{200}$ in both of them. In 1 case the foreign body was deep-seated, probably in vitreous, V=$\frac{20}{70}$. Of his 21 cases Dr. Barkan lost five, or 25%. Four of them required enucleation shortly after successful removal of the foreign body. In one, also a success as regards extraction of the chip of iron (Case 20), the eye had to be taken out, a few weeks after patient left the hospital, for irido-cyclitis and secondary glaucoma. In another (of his cases) (5) a large piece of steel had been successfully extracted, but patient, a heavy drinker, died of delirium tremens. Dr. Barkan came to the following conclusions:

1st. It is advisable always to enlarge the wound.

2d. Scleral section (as advised by Dr. Knapp) might be tried, when the foreign body is in vitreous.

3d. Haab's magnet is better than the hand magnet, because less infectious; he is not using it lately.

4th. Magnet is good and safe sideroscope.

5th. Sideroscope hardly successful. Also in London sideroscope is not used. Others, however, use it with good result (*e.g.* Axenfeld and Hirschberg).

6th. He does not apply X-rays, as being unreliable and a loss of time. In a supplement to his paper Dr. Barkan mentions, however, that it is successfully used by Treacher Collins, Lawford, and Mackenzie Davidson.

Dr. Lippincott, Pittsburg, Pa., in his paper on the advantage of strong portable or easily movable magnets in eye-surgery, reports 14 cases of foreign body removed from the eye by aid of a magnet during one year. Ten times the piece of steel was in the anterior portion of the eye. There were 9 good results; 1 refused operation; 4 times in the vitreous; 1 enucleation for marked sympathy; 2 attained quantitative light-perception; 1 good vision to be expected.

Dr. Chas. J. Kipp, Newark, N. J., detailed two cases of interest:

Case 1. Patient came a few hours after the accident. Eye free from irritation. Scleral wound *2mm* in length close to corneal margin, vitreous escaping, iris torn. Lens clear, dark mass at the bottom of the vitreous. Sideroscope reacted. When the eye was brought up to the magnet, a large glistening piece of metal back of the lens rose up and rushed toward the outer part of the eye. Sclera bulged there at a spot *6mm* posterior to wound of entrance. The foreign body became fastened and all effort to disentangle it, failed at first. No new incision made for fear of prolapse of more vitreous, a bead of which protruded at the wound. Then a new mode of application of the magnet was successfully tried: the magnet was turned around on its pivot and the other pole (not previously used) made the foreign body swing around in the vitreous. Bulging part of the sclera flattened and the other end of the piece of iron came towards the wound and shot out of it to the magnet. No further destruction of tissue. Wound soon closed. Recovery. Cataract developed in following week. Good light-perception, field intact. Piece of steel *18mm* in length, *2mm* in width at the one end, *11mm* at the other end.

Case 2. Patient presented himself a few hours after the injury was met with. Chip of steel pierced corneo-scleral junction, iris, and lens. After several attempts near magnet became fastened to posterior surface of the iris. Corneal incision made and chip *2mm* in length extracted by magnet. Bruised piece of iris cut off. At first, opacity of the lens seemed to increase, then it cleared up. **Five months later lens was clear again,** only a small opacity in the lower part of anterior capsule remained. $V - 0.75 = \frac{20}{20}$.

The first case was fortunate in every respect. The media being clear allowed observation of the motions of the iron obeying the magnetic power. There resulted no infection of the eye. A new hypothesis, based upon a well-known law of magnetic polarity was applied cleverly and to it is due a success in a difficult case. More than

remarkable is the fact, that there was found no contraction of the field.

The second case is a nice example of the clearing up of opacities of the lens along the track of the foreign body through it. Patient obtained V=$\frac{20}{30}$.

Two similar cases are found among Dr. Knapp's:

One (7) was admitted, the nasal side of the lens being opaque, details of fundus not discernible. When he left the hospital ten days after the extraction of the foreign body, he was able to count fingers at several feet. Seen later the cataract was found stationary for some time, and cleared up slowly. Five months after the operation "the opacity was reduced to a well-defined gray stripe running along the periphery of the nasal aspect of the lens. The remainder of the lens was transparent, the vitreous perfectly clear, the fundus as bright as in any eye. Pupil round and mobile. The only trace visible of the injury is the perforation of the iris on the nasal side." Fn. and Tn., with +2 D.V.=$\frac{20}{30}$.

The other case (53) shows the same process in its early stage. The wound of entrance was in the upper and temporal part of both cornea and lens; perforation of the iris could not be seen, but two fine synechiæ between the wound and the lenticular capsule were noticed. Lens was clear, except around the area of entrance. The synechiæ disappeared. Several weeks later the opacity of the lens had disappeared except a sharp gray line running sagittal through the former opaque lens. At a later examination, the pupil dilated normally through clear lens. V=$\frac{20}{30}$. Patient was presented at the academy.

There were many cases reported of clearing up of traumatic opacities of the lens, a fact familiar also to students of text-books on ophthalmology. When Dr. Knapp referred to his fortunate (7) case in a meeting of the New York Ophthalmological and Aural Society, the chairman, Dr. P. A. Callan, (7) was able to mention one among his own cases, wherein the final vision was $\frac{20}{30}$, the best result in his experience, he said. Dr. Gruening mentioned the occurrence of the same phenomenon in partial

cataract, which occurred as a result of touching the lens in glaucoma operations.

Dr. Fridenberg also spoke of a case of a foreign body in the lens, which did not cause any further opacification but that produced directly by itself. Dr. H. Knapp drew the attention to the clearing up of the rabbit's lens in ruptures after experimental wounds.

Amongst the many publications at hand on the question only one might be mentioned, that by Dr. M. Sacher (8). By means of the electro-magnet he extracted a chip of steel from the lens without development of a cataract at all. On the other hand it is known that a simple, and maybe a slight blow on the eye may produce a complete cataract, although there may be not even the slightest injury visible. One of Dr. Knapp's cases (60) might be mentioned in this place. A small chip of iron entered the anterior chamber through the cornea and was seen lying upon the anterior capsule of the lens without having penetrated it. At the first attempt with Haab's magnet it rushed against the cornea, fell to the bottom of the anterior chamber, and was readily extracted through a new corneal incision. A week later patient presented himself with his lens opaque all over the pupil. In Case 25 the same sequela was rather to be expected, because of the foreign body sticking into the capsule itself.

Dr. Heckel, Pittsburg, Pa., has published a case of good recovery after entrance of an infected chip of iron into the eye (9). On admission a black spot was seen in the iris surrounded by yellowish exudation. Ten days after the accident the foreign body was extracted with the magnet and iridectomy made. Recovery $V = \frac{20}{20} -$.

The location of the foreign body is the same as in Case 13, where it was removed without iridectomy. Eye recovered, but sight was not satisfactory. In this case as in many others of Dr. Knapp's there was present

beginning iritis without exudation, or more advanced inflammation of the iris producing smaller or larger hypopyon (Cases 2, 6, 10, 16, 17, 30, 38, 40, 46, 53, 61). None of these eyes was lost and in some of them good sight was obtained (*e. g.*, Case 2, V=$\frac{20}{30}$; Case 6, V=$\frac{20}{30}$; Case 16, V=$\frac{20}{70}$). In a few, improvement of sight could be expected. In Case 61 a very serious exudative iritis was cured. Repeated paracentesis of the anterior chamber was performed to allow escape of the hypopyon, which for some time re-formed quickly. The swollen lens-matter caused increase of tension and was partially removed by a linear extraction in combination with a small iridectomy. The opacification of remnants of the lens progressing, the infected lens-matter was twice allowed to escape through the reopened wound of the cornea. When the tension had been heightened and was not lowered under instillation of eserin, iridectomy was required and was successful. It opened at the same time the closure of the pupil due to the irido-cyclitic process. Final recovery. Even accumulation of exudation in the vitreous is liable to absorb during the treatment, as demonstrated by the cases of Group III A. The foreign body was seen surrounded by an exudation in Cases 20, 22, 58, all of which recovered. In one (36) the infection was too far advanced, so that enucleation proved a necessity. The others showed floating and diffuse opacities of the vitreous, which in two cleared up, the sight quickly improving ($\frac{20}{50}$ and $\frac{12}{200}$) and affording good prospects of further improvement.

Double perforation of the globe occurred in two of the cases (55 and 21). In the former the piece of steel was found sticking in the tissue of the optic nerve, rendering enucleation difficult. In the latter the chip was not found in the globe. A wound of the sclera near the optic nerve indicated that it had left the eye. It was not found in the orbit, where it remained quiet.

Two cases of the same sort are published, one of Dr. A. Nathanson. (10) The sclera was penetrated twice by the splinter 7 x 3.5 x 1.5*mm*, in size, which was found after the enucleation. In this case sympathetic neuritis set in two weeks after the injury. Recovery of the sympathizing eye, V=0.6. The other case is reported by Dr. Lehman and Cowl: (11) Double perforation of the eyeball by a piece of iron, found after the enucleation four and one-half months after the injury.

Some publications of a larger number of magnet-extractions might be added: Dr. H. Hildebrand, Hagen, Germany, (12) has reported 66 magnet operations, with successful extraction of foreign bodies in 53 cases. In 16 of them good sight was preserved. Fifteen of the foreign bodies were in the anterior chamber, iris, or lens. All these cases were successful, but one, which had been purulent before. Fifty-one were in the vitreous, in 13 the foreign body was not found, in 38 it was extracted with following results: 2 enucleations, 7 phthisis bulbi, 6 were lost sight of, 7 preserved shape of the eye, and 16 yielded good results and more or less good sight.

Cases, which on discharge had tolerably good sight, but soft eyes or notable turbidity of vitreous, were not counted among the successes, for they are apt to become worse by later detachment of the retina, or shrinking of the globe. In all these cases Hirschberg's magnet was used.

Dr. E. Fischer, Dortmund, recorded seventeen cases, which occurred in his practice in the years 1888 and 1889. They were treated by means of Hirschberg's magnet

Two of them had permanently good vision, $\frac{20}{30}$ and $\frac{20}{100}$; 1 lost through panophthalmitis though the foreign body was removed within 24 hours. Scleral incision; 2 required subsequent enucleation (4th and 5th); 1 could perceive movement of the hand excentrically (6th); 6 could count fingers from 2 to 8 feet, field was defective

(7th to 12th); 5 times the magnet failed to extract the foreign body: of those, in one case the foreign body was of copper; in two cases the foreign body was encapsulated 7 days and 7 weeks, respectively, after the accident; in one case the magnet elicited pain, but failed to extract, V=0. No irritation, no enucleation, in one case a scleral incision was made but magnet failed, 6 months later phthisis bulbi, V=0.

Dr. Sweet, Philadelphia, has treated 102 cases of foreign body since 1897 (14). Before the extraction with the magnet, he used to verify the diagnosis by aid of the X-ray. In 61 cases the foreign body was in the vitreous. 45 times extraction was attempted, 38 cases successfully extracted, 7 not successful; 5 of them required enucleation. Also in 5 of those extracted successfully, the eye had to be taken out subsequently. Sixteen required enucleation at once. There was found in the globe after the enucleation: 3 times steel, 3 times shot, 3 times copper, 4 times foreign body remained in the eye, 3 times operation was refused.

The X-ray as a means of diagnosis was not tried in Dr. Knapp's practice. Its application has been discussed repeatedly pro and contra. It was mentioned above, that Dr. Barkan is of the same opinion as is Dr. Knapp,[1] but it was also said that it is applied successfully in London. Dr. Weiss and Klingelhoefer, in Mannheim, published a paper (15) on localization of foreign bodies in the eye by X-ray photographs. They had good results.

Other publications were issued by Dr. Mengelberg, "Diagnostik intraocularer Fremdkörper durch Roentgen-Strahlen" (17), *Wochenschr. für Therapie und Physiologie des Auges*, No. 42, 1903, and by Dr. Bourgeois. The

[1] Dr. KNAPP does not underrate the value of the X-ray. As to the iron particles in the eye he had little trouble in extracting them with the Haab magnet. In particular cases, where he did not succeed, Drs. DIXON and WEEKS helped him out.

latter confirmed the diagnosis in 7 cases and was able to learn by the X-rays, whether the eye contained shot or a piece of steel (16).

Dr. Hellgruen reported 88 cases observed from 1890 to 1900 in Widmarck's and Nordenson's clinics (18). He considered the diagnostic value of the "giant-magnet used as a sideroscope," which, he thinks, is too dangerous. Asmus's sideroscope, he said, is indispensable. Furthermore he is of the opinion that X-rays applied in cases of children who are restless are not always satisfactory.

Professor Haab at the meeting of the American Medical Association at Saratoga on June 10–13, 1902, admitted the value of the X-rays for diagnostic purposes, but said they were uncertain for small particles. At the same time he communicated his experience in 165 cases of removal of foreign bodies from the eye by his magnet: the foreign body in 133 cases had penetrated the cornea, in 17 cases the sclera, and in 12 cases it stuck in the cornea.

He was able to see the foreign body in the retina 34 times, and in his opinion it is advisable to follow the extraction with the ophthalmoscope. He had 23 failures and 141 good results, or 86%. In 134 cases the foreign body was located behind the iris and lens; it was extracted in 111 of them or 83%. The failures were due to:

(1) The foreign body being too firmly fixed in the posterior wall of the globe;

(2) The foreign body being in the ciliary body from the first or getting there during the operation;

(3) Foreign bodies being enveloped by exudation;

(4) Foreign bodies being attached to its support.

In one of his cases the foreign body could be loosened by the reclination needle and was then removed by the magnet.

Enucleation was required 39 times. Of his cases 9 were lost through chronic irido-cyclitis, and in 19 the shape

of the eye was preserved, but the eye remained blind. He had 71 cases with good results, with or without a cataract. Of those 51 had good sight. Of his 165 cases the lens had been injured in 80.

The value of each of the well-known magnets has been discussed in numerous papers; some of them might be mentioned.

Professor Haab (20), while treating this question, demonstrated the reliability of his own electro-magnet, and said "the small magnet of Hirschberg will never be entirely discarded; it is, as it were, the best forceps for a foreign body, if the magnet can be brought into contact with the foreign body, but it does not act at a distance." At that time (24th Ophthalmological Congress, 1897) 60% of his cases had attained useful vision.

Dr. Sigmund Tuerck, Berlin, made careful theoretical investigations on Haab's magnet (21). He advances the opinion that, in using an attraction-magnet (as Haab, Schloesser, etc.), the smallest possible attractive power should be applied. Therefore for the different forms of splinters the magnet ought to be applied at different distances, because the eye might be severely injured, if care be not taken.

Professor Volkmann, Berlin, at the Ophthalmological Congress at Heidelberg spoke on the theory and practice of eye-magnets. They are divided into traction- and attraction-magnets; with the traction- or sound-magnet, the form of the foreign body is of no importance, but its diameter is. For the attraction- or powerful magnets, the weight of the foreign body is unimportant, but its form must be considered. Steel bullets, representing objects the most difficult to attract, he used as a standard for his investigations. The size is of no importance. Furthermore he expressed the opinion, based upon physical conditions, that the probing or sounding magnets used were too large in size, and he concluded that thinner sounds would be used with much more success. It is

due to the experimentation with too large pieces of steel, that probes of a too large diameter thus far have been introduced into the eye. On the other hand he showed, that even the smallest magnet is able to magnetize splinters of a larger size almost to saturation. He advised the use of an attraction- or powerful magnet in cases wherein the wound is fresh and the chip lying loose. The eye is to be approached slowly toward the magnet. For cases in which the foreign body is fixed he thinks the application of a too powerful attractive magnet is injurious, because the foreign body, as soon as it is freed, will rush very rapidly toward the magnet. Here the sounding or traction-magnet is preferable. It is introduced either with the current closed or not, according to the conditions and position of the splinter, taking into consideration the question whether the foreign body may make a quick jump or not. In the subsequent discussion Prof. Haab participated, reviewing his results and the mode of application of his magnet. Dr. Schreiber referred to the use of Volkmann's magnet. He mentioned his last four cases, one of which illustrated how a splinter was drawn around the lens into the anterior chamber. Dr. Schloesser spoke of the same experience. He said furthermore, that his own magnet never has failed in extracting pieces of iron. Professor Leber thinks there are iron splinters which resist the attractions of the most powerful magnets, those impacted into the wall of the eye. He mentioned one of his recent cases. The ophthalmoscope revealed the foreign body sticking in front of the equator and projecting towards the vitreous. Trial with the large magnet was unsuccessful. Scleral incision was made and Hirschberg's magnet introduced without result. Wound healed, hemorrhage absorbed, scar seen by ophthalmoscope close to the location of the splinter.

Dr. Th. Gelpke, Karlsruhe, had good results with Volkmann's large magnet. In his paper "On the Diagnostic Value of Large Electro-Magnets," (23) he mentioned

those of Haab, Hirschmann, and Schloesser, giving preference however to that of Volkmann because of the ease with which it can be handled. Hirschberg's small magnet, he said in agreement with Haab and others, will always be indispensable. The sideroscope is unreliable as shown by one of his cases, which indeed is very remarkable.

June 1, 1902, a laborer came to his hospital, stating that the sight of his left eye had failed recently. A scar was found on the cornea, a round opening in the iris, partial cataract. After dilating the pupil he saw in the fundus near the equator a yellowish prominence surrounded by pigment spots. The disks of both eyes were hyperæmic and hazy. Patient complained of photopsia of the right eye. Foreign body suspected. Patient recollected an injury he had suffered seven years ago. At that time he had been treated in another hospital and had been discharged after a few days, his eye being free from irritation. The sideroscope applied by Dr. Gelpke showed no reaction whatever. When put near Volkmann's magnet the prominence of the retina could be seen by the ophthalmoscope to protrude distinctly. Thus it was evident that the sympathetic irritation of the right eye had been excited by the presence of a piece of steel in the interior of the left. New scleral incision made in the neighborhood of the foreign body. Repeated trials with the magnet from different directions finally loosened it. The tip of the small magnet was then introduced and delivered the chip. It was 1.5*mm* in length, 0.8*mm* in breadth, 1*mg* in weight. The tenth day following the operation the patient resumed his occupation. The sympathetic irritation of the right eye had disappeared, the left was free from congestion and $V = \frac{A}{10}$.

The question of the tolerability of pieces of iron in the background of the eye has been treated repeatedly. Dr. H. Knapp (27) reported a case in which the eye tolerated a foreign body in the background for an unknown period. After an occasional irritation of the eye had been observed for a year, it was quiet up to the time of the last observation, when the foreign body for some reason

or other worked loose, causing an irido-cyclitis and making enucleation a necessity.

Dr. A. Elschnig (28) published a case of a foreign body in the eye changing its position. He is right in considering it a danger to the eye. Another one of his cases (29) gives a history of two years' tolerance. The foreign body had entered through the ciliary body, passed through the vitreous, struck the retina and sunk down to a lower position of the vitreous. It became united to the retina by new-formed connective tissue. Two years later it was seen resting in the same position. Changes of the retina and opacities of the vitreous impaired sight to ½, but no reaction was experienced.

A recent case of Dr. Knapp illustrates his idea that foreign bodies, though tolerated for long periods, are an imminent danger to the eye and "cannot be trusted" (27). This eye (Case 52) had tolerated the chip of iron for 11 years, when for some unknown reason a relapse of irido-cyclitis occurred and the eye had to be taken out, after the magnet failed to indicate the presence of iron. It was found partially encapsulated in the retina and was loosened from the underlying and surrounding tissue by a very slight touch of a needle. Probably it was beginning to work loose. See the pathological statement. Dr. Gelpke's case (26) also belongs to this class and is instructive because of the possibility of a sympathetic ophthalmia after a period of tolerance of seven years.

Dr. Gelpke in a pamphlet entitled "The First 15 Years of his Practice as an Eye-Specialist," (26) gave the following account of magnet-extractions. He had published his principles of the extraction of iron foreign-bodies from the eye in 1895 in the *Centralblatt für praktische Augenheilkunde.* Up to that time he had been in possession of a small Hirschberg's magnet only. He made it a rule, not to introduce the tip of his hand-magnet into the canal of entrance of the foreign body so as to avoid the possible introduction of germs into the vitreous.

(This precaution seems to be wise; for two of Dr. Knapp's cases presented themselves with beginning infection of the wound and vitreous, after some other physician had attempted removal by introduction of the magnet into the wound.) Gelpke used to make a new incision of the sclera near the place where the foreign body was found to have lodged, and there he introduced the tip of his magnet. After each magnet-operation *1ccm* of a hydrarg. cyanat. solution was injected into the vitreous. Of 59 cases he had failed to extract the foreign body only in three, in which he was obliged to remove the eye. In the first the foreign body was fixed into the posterior wall of the eye; in the second and third the chip had been so firmly entangled in exudative products, that it was unable to follow the magnetic power. Of his cases 38 came soon after the injury; 3 required enucleation for infection, the remaining 35 cases had vision as follows: 8 cases V = $\frac{6}{6}$ to $\frac{5}{6}$, 18 cases V = $\frac{4}{6}$ to $\frac{2}{6}$, 9 cases V = $\frac{1}{6}$ to $\frac{1}{10}$.

He found out that, the larger the foreign body and the more extensive the injury, the less was the vision. The size of the foreign body was in the first 8 cases from $\frac{1}{2}$ to *2mm*, second 18 cases from 1 to $5\frac{3}{4}$*mm*, third 9 cases from 4 to $12\frac{1}{2}$*mm*.

In all the cases but two of the first and second groups, the canal of entrance was found leading through the sclera. In those of the third group the foreign body penetrated the limbus corneæ or cornea, iris, and lens. Traumatic cataract was a rule. The sight, as noted above, remained the same except in four cases, where atrophy of the optic nerve developed, so-called "traumatic amblyopia." Of the remaining 28 cases 23 showed distinct symptoms of infection on admission, in 5 of them the eye had been badly lacerated by pieces of iron of an extraordinary size (8–21*mm*). The foreign body had been removed in all of them, but no sight could be obtained. Enucleation proved a necessity in 19 of them: partly at the patient's own request so as to hasten the

treatment and enable him to resume his work; partly for impending sympathetic ophthalmia, or other reasons.

On siderosis bulbi the latest comprehensive publication is the paper read by Professor Vossius (Giessen) at the twenty-ninth meeting in Heidelberg, 1901 (30). The symptoms are the following:

(1) Hemeralopia caused by degeneration of the retina. (2) Contraction of the field of vision. (3) Impairment of sight. (4) Brownish, yellowish, or greenish discoloration of the iris in combination with brownish discoloration of the cornea. (5) Brown or yellowish spots upon the anterior capsule of the lens. (6) Subsequent cataract of a "light brown or orange-colored" hue, consisting of diffuse discoloration or dotted appearance. (7) Subluxation or luxation of the lens, which is opaque or shrunken, possibly caused by degeneration of the zonule of Zinn and vitreous. (8) Spontaneous dilatation of the pupil and resistance to atropin.

The authors agree in their opinion of the value of the symptoms of siderosis for the diagnosis of the presence of iron in the eye; illustrated by cases of Vossius, von Hippel, Hirschberg, and others, who succeeded in demonstrating and extracting foreign bodies from eyes which showed merely discoloration of the iris. The fact is remarkable that the regeneration of the original color of the iris may take place quite completely. Vossius saw it disappear in one case seven years after the accident; the foreign body had been in the eye for five years. Dr. Pfalz mentioned two cases proving the possibility of the same phenomenon. Dr. Cramer (31) published a case of the same kind. He entitled his paper: "A Perfect Restitution of an Eye Affected with Siderosis." Professor Vossius illustrated another very remarkable symptom by one case of especial interest: the spontaneous dilatation of the pupil in eyes affected with siderosis. The patient was sent to him in August, 1900. Some time previously he discovered that his left pupil was larger than the right.

A physician instilled eserin but the pupil remained large. Another physician suspected syphilis and treated him with inunctions, which had to be discontinued after mercurialism had set in. A third physician surmised an intracranial affection. The patient was sent to Prof. Vossius. He had become neurasthenic and melancholic during the different treatments. On admission, the iris of the right eye was blue, that of the left "rusty-brown." The left pupil was fully dilated, no synechiæ present. Yellowish-brown patches upon the anterior capsule, opacities of lens and vitreous. Complaints of hemeralopia. Fundus not visible but V— $\frac{8}{10}$. No scar of cornea or sclera. At once a diagnosis was made of iron in the eye. As a matter of fact the patient recollected that a year before he had felt pain in his left eye for a moment while hammering a stone. Nothing was seen, and the eye was free from irritation the following day. A foreign body was thought to have penetrated the sclera and, being aseptic, to have healed in. The foreign body was extracted. Carefully reviewing his material and the literature, Vossius found more cases. Four others of his 14 cases of siderosis were affected with spontaneous dilatation of the pupil, 3 times the pupil was moderately dilated, once ad maximum. In two of them later on the pupil contracted again spontaneously.

Dr. Carl v. Schuetz-Holzhausen (32) is cited with two cases from Mayweg's clinic, one 5 months, the other 1 year after the injury. Dr. E. Wingenroth (33) with one case. The pupil was moderately dilated 7 months, and ad maximum 2 years after the accident. In Prof. Hirschberg's material (34) the symptom is mentioned in one case. Two months after the accident the pupil was large and eight months later narrow again. Prof. Vossius's hypothesis is, that through accumulation of iron the fibres of the intraocular branches of the sympathetic nerve are paralyzed and atrophied, as the pupils resist the application of atropin and other mydriatics.

E. v. Hippel (35) and Dr. Hertel (36), who also observed the resistance of those pupils to atropin, thought this caused by atrophy of the muscles of the iris, especially of the sphincter. The investigations on this question are not finished at present. Microscopically von Hippel, by staining with Perls's method, found in the cells of both sphincter and dilator muscles deposits of iron in a case of total degeneration through siderosis of the detached retina. In the same specimen he happened to show the blue iron-staining also in the epithelium of the lens-capsule, though no lesion of the capsule could be found. It is known (Vossius, von Hippel, and others, *l. c.*) that very small particles of iron may be completely oxydized, causing the symptoms of siderosis to persist for years. Dr. Neuburger, of Nuremberg, published a case (37) of siderosis in which no foreign body was found. Possibly it is one of this class. Complete oxydation as well as perfect encapsulation of particles of iron are supposed to be responsible for negative reaction of the sideroscope in cases of siderosis. A good many cases of siderosis Dr. Knapp has seen in New York, especially in the dispensary; they are shown to the students, but commonly not admitted to the hospital, which accounts for the limited number (K.). In the cases of the fourth group siderosis can be expected; all were lost to observation, but in one (29) which realized the expectation the iris was discolored (the hue is not mentioned in the history) and there were rust specks arranged circularly at the periphery of the anterior capsule. Pupil reacted, lens was clear with exception of two fine scars, one of its anterior, the other of its posterior capsule. Iron could not be seen, but was demonstrated by a slight reaction of the sideroscope. Siderosis has been seen only in two more cases. In Case 52 brownish discoloration was the symptom. The pupil was closed by the irido-cyclitic process, the lens shrunken. The foreign body had been in the eye for 11 years and was encapsulated, all but

a small corner, which protruded toward the vitreous chamber. Microscopically degeneration of the retina was found, and staining after Perls's method showed iron. In Case 48 the discoloration of a brownish hue was found three months following the magnetic removal of the chip of iron, when patient was readmitted for extraction of his traumatic cataract. The color of the iris had not changed 9 months after the cataract extraction.

In conclusion it might be mentioned that the technic of the extraction is being improved as to the application of the magnet. The advantage of repeated closing and breaking of the current was known long ago, as well as the introduction of the tip of Hirschberg's magnet, the current open or closed, according to the seat of the foreign body; closed when a slow attraction is wanted and open when there are no tissues in the way between the foreign body and the magnet, so that a rapid rush toward the tip will not be injurious. Concerning the respective suitability of a traction- or attraction-magnet, Prof. Volkmann has given theoretical and practical considerations. Technical investigations on the eye-magnet were made recently by Dr. Tuerck (21).

Also the after-treatment of the extraction has been improved during the last years. The surgical technic is entirely the same as in other cases of injuries and is found in the text-books and others, as in Braun's book on that subject. Prof. Haab in cases of suspected infection introduced small chips of iodoform-gelatin, or thin sticks of that substance into the vitreous. He as well as other authors considers this a useful procedure. Gelpke after using the same disinfectant prefers the instillation of 1 *ccm* of a solution of hydrargyrum cyanate with a Pravaz syringe into the interior of the eye, and he has had good results.

REPORT OF CASES OF FOREIGN BODY IN THE EYE.

By Dr. JOHN E. WEEKS, New York.

(With three diagrams on Text-Plate XII.)

WHEN a patient with a foreign body in the interior of the eye presents himself for treatment, it is my practice to ascertain the exact location of the foreign body as nearly as possible, by means of the ophthalmoscope if the media are clear; by skiagraphy if the media are not clear, before I attempt its removal. The practice of attempting the removal of magnetic foreign bodies by means of the giant magnet before exact localization is made makes the work more uncertain, subjects the patient to unnecessary risk of preventable accidents, and does not permit of the development of the best possible procedure.

Case 1.—**The patient, the report of whose case follows, was kindly referred to me by Dr. Herman Knapp for operation after the foreign body had been skilfully and accurately located by skiagraphy** by Dr. George S. Dixon. (Fig. 1, No. 1.)

Robert M., aged twenty-six, seen Nov. 17, 1906. On Nov. 11th, while holding a piece of iron the end of which was being cut off by means of a chisel and hammer in the hands of a workman, a piece of iron struck him in the eye and entered the globe at a point *2mm* below the margin of the cornea and about *5mm* to the nasal side of the perpendicular meridian. Attempts had been made to remove the piece of steel by means of a "giant" magnet.

When seen by me the eye had been very painful during the two preceding nights. There was marked pericorneal

injection. The iris was congested and a number of posterior synechiæ were present. The condition was one of acute iritis.

The patient was admitted to the New York Eye and Ear Infirmary and an attempt was made by means of the giant magnet to draw the foreign body to the posterior surface of the lens, around the lower part of the equator of the lens into the posterior chamber, from which it was designed to remove it through an incision in the cornea. The magnetic force was applied in the direction best calculated to accomplish this result, but, although repeated attempts were made, the foreign body did not come forward. No pain was elicited until the point of the magnet was placed near the sclera opposite to the point of the supposed resting-place of the foreign body. When this was done the patient winced and said that he experienced a sharp pain. No bulging of the sclera was visible. As the attempt to draw the foreign body forward was not successful, it was decided to attempt removal through the sclera, but a second localization was deemed advisable to ascertain the site of the piece of steel after it had been subjected to the action of the magnet. The skiagraphs were immediately taken by Dr. Dixon, and it was found that the piece of steel had moved forward from 5 to 7*mm* from its original site. (Fig. 1, No. 2.)

The patient was placed on the operating table and the eye thoroughly cleansed and cocainized. The eye was then rotated upward and inward by means of a "guy" suture. The opening through conjunctiva and subconjunctival tissue was made, exposing the sclera in the lower-outer quadrant. A meridional incision, 3.5*mm* long, beginning at the equator of the globe and cutting forward, converted into a shallow "T" by means of a short incision at its middle at right angles with the first, was made through sclera, choroid, and retina. A soft iron tip attached to a Hirschberg magnet was then brought to the opening in the globe. When it reached the scleral wound the piece of steel immediately became attached to it and was withdrawn. It was not necessary to enter the vitreous chamber at all with the tip of the magnet. No vitreous was lost.

The wound was closed by suture through the conjunctiva and subconjunctival tissue and the eye bandaged. An un-

eventful recovery took place; the iritis subsided. No pain was experienced after the first night following the operation. The lens is cataractous. Projection is good in all parts of the field, making it probable that fair vision may be secured by removal of the cataract.

The case is one that beautifully illustrates the great value of the accurate localization of a foreign body within the eyeball.

Case 2.—Frank J., æt. thirty-three years, came to the New York Eye and Ear Infirmary Jan. 20, 1907, on the recommendation of Dr. Herman Knapp. The patient stated that two weeks previously, while working with a file, a fragment of the file struck him in the right eye. The eye became inflamed. Attempts to remove the foreign body by means of a "giant" magnet had been made before the patient was referred to the New York Eye and Ear Infirmary.

Skiagraphs were taken by Dr. George S. Dixon with the result of locating a foreign body in the eye as depicted in Fig. 2. Through the kindness of Dr. Knapp and Dr. Dixon, the patient was referred to me for operation.

Status Præsens.—Ocular conjunctiva much injected; cornea and anterior chamber cloudy; iris congested; some exudation in pupillary space; eye sensitive to touch $V = \frac{1}{\infty}$. Considerable pain in eye and temple. A condition of irido-cyclitis in its early stage.

Operation.—An attempt was made with the giant magnet (Haab's) to draw the foreign body around the equator of the lens into the posterior chamber, but, although repeated trials were made, the desired result was not obtained, nor could any appreciable change in the position of the foreign body be made by application of the magnet to any part of the fibrous coat of the eye that could be reached by the point of the magnet. A T-shaped opening was then made through sclera, choroid, and retina in the outer-lower quadrant of the globe back of the ciliary body, between the insertion of the external and inferior recti muscles, the horizontal member of the T being 4.5*mm* long, the vertical member about 1.50*mm*. The medium-sized point of a Johnston magnet was then introduced into the vitreous chamber in the direction of the location of the foreign

body The point entered but a short distance at first; it was passed farther in at each succeeding attempt until on the fifth or sixth introduction it was returned with a small foreign body adherent to the tip of the point.

The vitreous humor bulged into the wound, but there was no loss.

The conjunctiva and subconjunctival tissue were drawn over the wound by means of a suture and the eye bandaged. The wound healed but the irido-cyclitis continued. The globe became soft and the degeneration consequent on irido-cyclitis followed.

A remarkable feature of this case was the great difficulty of influencing the particle of steel by the magnet. Whether it was due to the composition of the steel or to the tissues in which the particle was lodged is not determined. If the particle of steel had not been definitely located by means of the X-ray skiagraphs, it is probable that the efforts to remove it would not have been persisted in until a successful result had been reached.

Case 3.—George M., referred to the New York Eye and Ear Infirmary on May 7, 1907, by Dr. Herman Knapp, for the purpose of having an X-ray picture taken of the left eye after attempts at removal by means of the "giant" magnet had failed.

In the absence of Dr. George S. Dixon, skiagraphs were taken by me and the location of the foreign body was plotted as per Fig. 3, No. 1. It will be seen by this figure that the foreign body had entered the sclera and was lodged in that membrane. The patient was returned to Dr. Knapp, who on the following day requested me to operate for the removal of the foreign body. The conditions then were as follows:

Eye quiet, ocular conjunctiva being very slightly injected. The cornea presented a small, closed wound at the temporal side, about *2mm* above the horizontal meridian where the fragment of steel had entered, and immediately beneath this wound the iris was perforated. The pupil was dilated, circular, except at the temporal side, corresponding with the site of the perforation made by the foreign body, where the circle was less acutely curved. Lens clear. Vitreous clear. At the temporal

side of the disk and above there was a patch of what appeared to be exudation, about the size of the disk but irregular in outline, not raised. A small spot of escaped blood occupied its centre, and to the temporal edge a minute dark point was visible, which I took to be a point of the foreign body.

Thinking that possibly the fragment had passed almost completely through the sclera, an attempt was made with the Haab magnet to pull it into the orbital tissue with the intention of removing it from this tissue by subsequently cutting down upon it. The globe was rotated as far nasally as possible and the magnetic force applied slightly back of the equator of the globe without result. An attempt was then made to draw the foreign body into the eye by applying the magnetic force in the direction of the antero-posterior axis of the globe, the pole of the magnet being brought close to the cornea. The patient experienced a twinge of pain. On examination with the ophthalmoscope the patch of exudation was found to have greatly changed in appearance. Its lower temporal half was obscured by fresh hemorrhage and there was a small hemorrhage into the vitreous extending downward and outward. The retina below and to the temporal side was slightly obscured. Very careful examination failed to detect a trace of the foreign body.

An attempt was now made to cause the foreign body to enter the posterior chamber, the intention being to eventually bring it into the anterior chamber and to extract through the cornea. All efforts in this direction failed, although at no time was the magnetic force intentionally applied in a direction to cause the fragment to lodge in the ciliary body.

A second set of skiagraphs were taken which showed the site of the foreign body to be near the posterior extremity of the ciliary process to the temporal side above. (See Fig. 3, No. 2.)

On May 13th an attempt was again made to remove the foreign body by way of the anterior route by means of the Haab magnet. Although evidence of traction on the foreign body was manifest in the slight pain occasioned, the attempt failed.

It was then decided to attempt removal by way of an opening through the sclera. The globe was held in rotation downward and inward by means of a "guy" thread, and a meridional

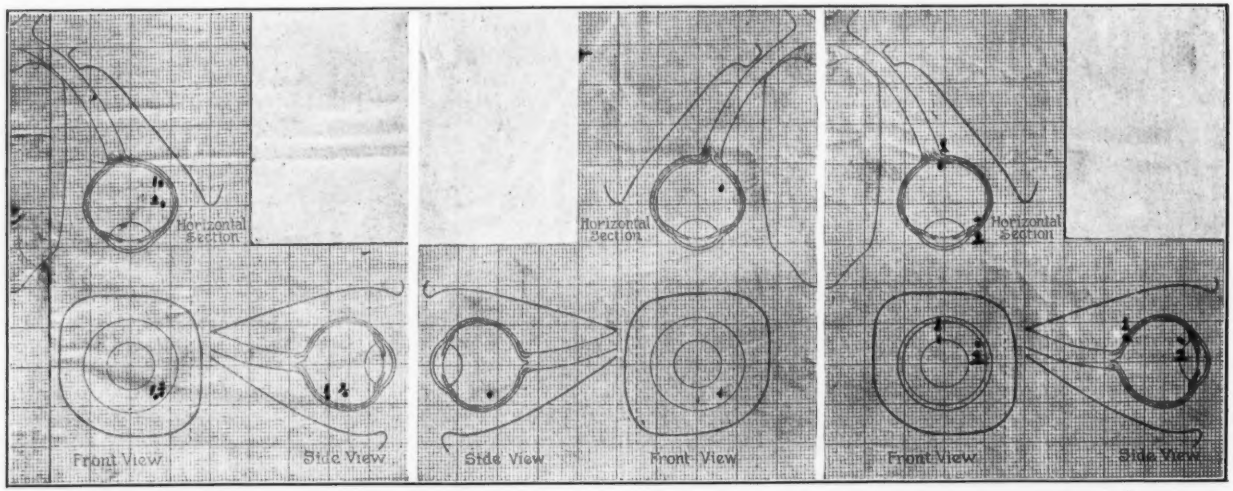


Fig. 1.—Robt. M.
1. Primary location of piece of steel
2. Secondary location

Fig. 2.—Frank J.

Fig. 3.—Geo. M.
1. Location of piece of steel when first attempt at removal was made
2. Location when final attempt at removal was made

incision was made through conjunctiva and subconjunctival tissue to the sclera, in the upper-outer quadrant of the globe, immediately over the supposed location of the foreign body. A shallow T-incision, the long member (3.5*mm*) of which extended meridionally, was made through sclera, choroid, and retina, commencing just back of the ciliary zone. The Sweet magnet was then employed, one of the longer, bent tips being attached to the magnet. This tip was introduced just within the lips of the wound without result. The cone-shaped tip was now attached to the magnet and the point applied to the wound when the fragment of steel became immediately attached to it. There was no loss of vitreous. The wound was closed by means of a single suture, which included conjunctiva and subconjunctival tissue, and the patient was returned to Dr. Knapp at the Ophthalmic and Aural Institute.

The further record of the case, as follows, was kindly furnished by Dr. Knapp:

May 20th.—No pain. Vitreous clearing. Vision improving.

May 21st.—Suture removed.

May 22d.—Virtually recovered. No pain. Vision = $\frac{20}{30}$. Left for home.

I wish to acknowledge my thanks to Dr. Knapp for his kindness in referring the patient to me. The difficulties encountered in the removal of the fragment are apparent from the foregoing description. I wish to call particular attention to the greatly-reduced magnetic force obtainable by long narrow tips to magnets.

ON DISEASE OF THE TARSUS AND LID MARGIN IN TRACHOMA.

By Dr. E. RAEHLMANN, Weimar.

Abridged Translation from the German Edition, Vol. XLVI., No. 3, by Dr. Percy Fridenberg.

(With nine figures on Appended Plates XIV–XVII.)

IMPLICATION of the cartilage in trachomatous affections of the conjunctiva is generally thought to depend on the granular changes in the latter membrane and to be in the nature of a purely secondary change. While this is conceded as far as it applies to the cicatricial changes in the form of the tarsus, it is doubtful whether even this process could occur unless the cartilage had already lost some of its normal structure by participation in the trachomatous process. It is certainly remarkable that the cartilage which never seems to be affected in other inflammations of the conjunctiva, not even excepting the gonorrhœal variety, is so frequently and regularly involved in trachoma, and a direct participation of the tarsus and lid margin in the disease process seems highly probable.

A series of clinical and histological studies and my experience in the last ten years justify the conclusion that in inveterate trachoma there is an early development of trachomatous tarsitis which keeps pace with the various phases of the disease and has a decided influence on its course. The tissues of the lid margin show an early interstitial blepharitis. The first clinical sign is a change in the secretion of the Meibomian glands,

which is normally clear, viscid, and scanty, so that usually only a very small amount can be expressed. As long as the development of granulations is limited to the fornix folds no change in this secretion is observed. Implication of the tarsus causes the secretion to become abundant, cloudy, and oily. In cicatricial trachoma it may become crumbly, doughy, semi-solid, and frothy. This secretion may at times be expressed in a coiled thread like a comedo or blackhead and is generally mistaken for conjunctival secretion. Chalky concretions may also be found. These changes are found regularly after the development of granulations in the tarsal portion of the conjunctiva. Hyperæmia of the intermarginal portion of the lids around about the Meibomian glands is another marked symptom. The orifices appear as with thickened borders in the middle of a small reddened hillock, so that in marked cases there is a decided nodular irregularity of the inner third of the lid margin, while the outer margin is swollen and thickened, particularly about the roots of the lashes. This irregular thickening, tylosis, of the lid margins plays an important rôle in the development of trichiasis. Characteristic granulations may be found on the lid margin (Fig. 6).

Microscopic examination shows that even in the early stages of trachoma inflammatory changes are not limited to the palpebral conjunctiva, as small round-cell infiltration can invariably be followed into the tissues of the tarsus. In the neighborhood of the granulations this infiltration goes deepest, while it may be rather superficial at other points. In advanced cases of granulations in the tarsal conjunctiva there is general, diffuse, small-cell infiltration, and at times aggregations of round cells which look like newly formed follicles. In later stages attended by induration of superficial granulations, typical follicles may be found in the depths, which are bounded, toward the thickened conjunctiva on the one hand and toward the Meibomian follicles on the other, by a more or less

dense, infiltrated tissue (Fig. 2, *a*). At a comparatively late stage the infiltration may invade the acini of the glands. The conjunctiva has generally been converted into a thick cicatrix by the time the tarsus has become completely infiltrated, and retraction easily leads to deformity of the softened cartilage. The trachomatous process may have come to a standstill in the conjunctiva and persist in the depths of the cartilage as a typical trachomatous tarsitis, leading at times to complete destruction of the glandular structures. Deep-seated follicles may even work their way through the infiltrated soft tissues of the lid and appear outside the skin (Fig. 5).

The destruction of the Meibomian glands is more rapid and complete in the upper portions of the tarsus. Entropion develops in about half the cases of severe trachoma. A mould-shaped deformity of the cartilage results from cicatricial contraction of the inner surface in case the tarsus itself retains its normal dimensions, toughness, and resistance, but is lacking where the cartilage itself is markedly affected and has become atrophic and shrunken. The most marked deformity occurs where the middle of the tarsus has been most deeply affected, while the margins still retain some toughness. Fatty degeneration of the cicatrix may produce a newly formed loose reticular tissue. Krause's glands and the so-called accessory lachrymal glands of the conjunctiva are often found in a state of extreme hypertrophy, perhaps as a vicarious manifestation for the lost function of the atrophic Meibomian follicles.

EXPLANATION OF THE ILLUSTRATIONS.

FIG. 1. Horizontal section through the upper margin of the tarsus. Transition of granulations into the tissue of the tarsus.

a. Conjunctival granulation.

b. Granulation in tarsal tissue.

c Gland.

d. Lymph-cell infiltration.

FIG. 2. Transverse (sagittal) section through the middle of the cartilage. Marked cicatricial entropion. Granulation in the depth of

the tarsus, forming the centre of deformation. Meibomian gland markedly atrophic, and appearing as a sebaceous gland stump.

Conjunctival scar. Marked round-cell infiltration of tarsus and lid margin. Cell aggregations in cicatricial tissue.

a. Focus of softening (follicle) in the cartilage.
b. Conjunctival scar.
c. Trachomatous gland.
d. Fresh follicle.
e. Rudimentary Meibomian gland.
f. Conjunctival scar in the lower tarsus.
g. Accumulations of round cells.

FIG. 3. Vertical section through the middle of the lid. Cicatricial trachoma. Bending of tarsus. Cicatricial destruction of Meibomian gland. Marked entropion.

a. Excretory duct of Meibomian gland.
b. Conjunctival scar.
c. Cilium.
d. Scar in cartilage.

FIG. 4. Vertical section through the middle of the lower lid. Marked cicatricial entropion. Destruction of Meibomian gland. Conjunctival scar and tarsal tissue not to be differentiated. Cystic cavity surrounded by small-cell infiltration.

FIG. 5. Vertical section. Marked conjunctival and tarsal scar. Preserved acini of gland communicating with skin by an excretory duct lined with epithelium.

a. Fistula.
b. Conjunctival scar.
c. Remains of Meibomian gland.
d. and *e*. Cystoid enlargement, dilatation.

FIG. 6. Vertical section through the lid margin. Lid-margin granulations around the orifice of a Meibomian gland. Small-cell infiltration of the entire lid margin, particularly around the follicle.

a. Follicle in the dense tissue of the lid margin.
b. Meibomian gland.
c. Moll's gland, ectatic.

FIG. 7. Sagittal section through the middle of the upper lid. Cicatricial entropion. Arlt's fold. Scars of the lid margin. Twisting of tarsus and Meibomian gland. Tarsus bulged forward by marginal scar. Marked infiltration of entire tarsus and lid margin.

a. Excretory duct of Meibomian gland.
b. Upper part drawn forward, Meibomian gland.
c. Lid-margin scar.
d. Conjunctival scar, upper third of lid, lower.
e. Conjunctival scar, upper part of lid.

FIG. 8. Vertical section through the middle of an upper lid. Cicatricial entropion. Almost complete atrophy of Meibomian gland.

Scar in conjunctiva and in tarsus, of same histological character. Marked small-cell infiltration of cartilage and lid margin.

FIG. 9. Vertical section through the middle of an upper lid. Complete atrophy of Meibomian glands and ectasia of the glands of Moll at the lid margin. Concretions in the conjunctiva. Fatty degeneration of the tarsal tissue.

a. Concrements in conjunctival glands.
b. Reticular tissue replacing original scar.
c. Remains of scar.
d. Ectasia of Moll's gland.

THE OPTICAL SIGNIFICANCE OF THE ACCOMMODATIVE PUPILLARY MOVEMENTS.

By Dr. JOHN WEIDLICH, Elbogen.

Translated from Vol. XLV., German Edition, by Dr. Alfred Braun, New York.

(*With one figure in the text.*)

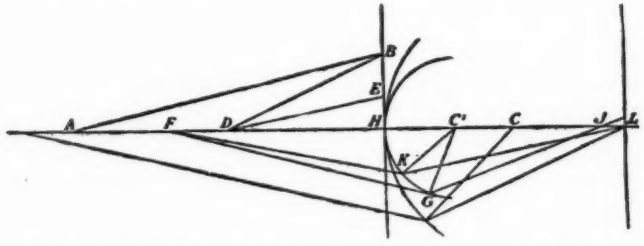
IT is well known to every physician who has concerned himself to any extent with ophthalmology, that atropin causes very unpleasant visual disturbances. This depends partly upon the paralysis of accommodation and partly upon the so-called mydriatic visual disturbances due to dilatation of the pupil. This mydriatic disturbance can be observed apart from the paralysis of accommodation, in allowing a myope who is under the influence of atropin to view objects at the far-point, or in allowing a myope with the correcting glass, or an emmetrope to look into the distance.

The mydriasis causes an increased amount of light to enter the eye, thus causing a certain amount of dazzling. But another factor is the diminution in sharpness of the image upon the retina, due to the rays passing through the peripheral parts of the lens, causing spherical aberration.

Thus with a dilated pupil, even in a darkened room, where dazzling from an excess of light cannot take place, the visual acuteness is diminished.

This fact clears up the meaning of the movements of the pupil, which accompany the accommodative changes in the crystalline lens.

The iris has two functions to perform: first, to regulate the amount of light which enters the eye, and secondly, to shut out the peripheral rays, which interfere with acuteness of vision.



The upper half of the drawing represents the pupillary plane placed in the principal plane of the reduced eye. The bundle of light from A, enclosed by the angle B A H, passes through the upper half of the pupil H B. If the pupil remained the same size for the bundle of light coming from D, the angle B D H > B A H. If D E is made parallel to A B, however, the angle E D H = B A H.

The lower half of the drawing shows that with a more marked curvature about C′ as a centre, a shorter arc corresponds to the same angle in the case of the less marked curvature about C as a centre; consequently the peripheral ray F G is refracted more strongly to J, whereas the more central ray F K is not refracted so strongly to L.

It is easy to see from the accompanying illustration that:

1. When the pupil is constant, nearer objects send broader cones of light into the eye than more distant objects—*i. e.*, the changes in the size of the pupil equalize the amount of light which enters the eye, for objects viewed at different distances. 2. In refractive media with spherical (or approximately spherical) surfaces, the area of the central portion of the surface, where spherical aberration is not marked enough to be a disturbing factor, diminishes with the increase in curvature of the refracting surfaces, and increases with the diminution of curvature.

This is made clear from the fact, that only those oblique

rays of a bundle of light, whose points of incidence are equidistant from the principal point, meet in the same point in the optical axis. They lie, in the case of an accurately spherical refracting surface, upon the surface of a cone (or on the surface of a cylinder parallel to the optical axis), which is formed by turning an oblique ray through 360° about the point of origin of the light, retaining the angle formed by the ray and the optical axis always constant.

Only as long as the distances of the points of incidence from the principal point differ very little, can we speak of a common point of junction of a homocentric bundle of light.

Other things being equal, with a shortening of the radius of curvature, the distances on the refracting surface increase, and consequently the area about the principal point, which receives rays which meet almost at the same point, is much smaller.

Hence we see why the different curvatures of the crystalline lens, which occur in accommodation, are accompanied by changes in the size of the pupil—*i.e.*, why, with greater curvature of the lens, the pupil becomes smaller. (The frequent association of myosis with hyperopia, in which there is increased accommodation, and the association of mydriasis with myopia, can be explained in this way.)

In looking at objects at a distance, the curvatures of the lens becomes less. A dilatation of the pupil results, because the area where spherical aberration is not troublesome becomes larger, as well as—in order to allow a larger quantity of light to enter the eye—because less light enters the eye from distant objects than from near objects.

Consequently we can say that the movements of the pupil, which occur in fixing objects at varying distances, contribute an optical help to accommodation, inasmuch as they prevent the occurrence of diffusion circles—

i. e., they prevent a diminution in the number of visual units produced by a given object, by preventing the units of the image from being larger than the retinal units. Thus we may speak of the movements of the iris as an accommodation of accommodation, or an accommodation of the second degree. This agrees with Donders's statement, that pupillary contraction follows accommodation to a slight extent.

The value of the size of the pupil in determining the clearness of vision has long been recognized. It was known that the visual disturbances resulting from paralysis of accommodation were increased by the accompanying mydriasis, so that in cases of pure paralysis of accommodation the visual acuteness for distance was normal, whereas with accompanying mydriasis the visual acuteness for distance was considerably diminished. In the latter case, the vision for near was worse than could be explained by the paralysis of accommodation alone. In cases of mydriasis alone, vision was diminished at every distance.

In cases of mydriasis without paralysis of accommodation, visual disturbance is greatest for near vision, due to dazzling from the entrance of too large a quantity of light into the eye, spherical aberration, and chromatic aberration. Vision is much improved by placing an opaque plate with a stenopaic opening in front of the eye. Such a plate is also of value in determining latent hyperopia by means of atropin, although sometimes full vision is obtained with the correcting glass, even without the stenopaic opening. This is due to the fact that an eye which has been accommodating constantly, when the accommodation is relaxed, allows a certain amount of dilatation of the pupil without interfering with the visual acuteness.

A wide pupil accompanies distant vision. The purpose of this is to allow more light to enter the eye, since a smaller bundle of rays of light enters the eye from each

point than in the case of near objects, and consequently distant objects would not be seen as plainly as near objects, if the pupil remained contracted.

We can say that a pupil which is fitted for near vision might be considered a relative myosis for distant vision, causing corresponding visual disturbance, and a pupil which is fitted for distant vision might be considered a relative mydriasis for near vision, causing corresponding visual disturbances.

Myosis causes a contraction of the visual field, and in near vision the sight is concentrated upon the important details. Dilatation of the pupil, in distant vision, enlarges the visual field.

The changes of the curvature of the anterior surface of the lens, during accommodation, are quite considerable. The radius of curvature is 10*mm* for distance and 6*mm* for near. A dioptric apparatus which undergoes such changes in curvature requires a diaphragm arrangement, which can be varied for the different degrees of curvature.

This diaphragm must be so arranged that for each refractive condition of the dioptric system there should be the greatest acuteness of vision, with sufficient illumination.

INTRABULBAR PSEUDO-TUMORS IN CHILDREN.

By Dr. STOEWER, Witten.

Translated from Vol. XLV., German Edition, by Dr. Alfred Braun, New York.

Elsie D., three and one-half months of age, was first brought to my office on June 28, 1898. The parents stated that the child's right eye was somewhat smaller than the left, since birth. I did not see the child, myself, at that time. In my journal, I find the following:

The right eye is somewhat divergent. The iris is narrowed in its upper nasal portion. Fundus normal. Myopia.

On February 21, 1899, the child was again brought to me, on account of an inflammation in the right eye.

The parents and four living brothers and sisters were healthy. The child had no other sicknesses, outside of the eye trouble. She had had no fever, nor convulsions, nor anything pointing to a possible meningitis. The parents also denied the possibility of an injury to the eye.

The redness of the eye appeared, without any apparent cause, in the beginning of February.

Objective examination on February 21, 1899, showed the following:

The right eye is slightly divergent, and shows pericorneal injection. The cornea is smooth, clear, and transparent. The anterior chamber is very shallow. The pupil is slightly dilated and shows no reaction. The iris is atrophic. A grayish-yellow reflex appears in the depths of the pupil. The fundus cannot be seen with the ophthalmoscope. Immediately behind the lens, there is seen by oblique illumination, as well as by daylight, a decided yellow reflex. Intraocular pressure is perhaps slightly increased.

As the media were clear when the child was first seen, we have undoubtedly to deal with an acquired pathologic condition. The history speaks against the possibility of a plastic or tuberculous choroiditis, as well as against traumatic changes. A diagnosis of a possible glioma was made, and the eye enucleated on February 22, 1899. At the operation, numerous cicatricial adhesions between conjunctiva and sclera, in the upper nasal portion of the ball, were especially noticeable. The wound healed readily, and the orbital contents have remained normal up to the present.

The eye had a sagittal diameter of *20mm* and a horizontal diameter of *19mm*. It was fixed in Müller's fluid and hardened in alcohol.

Behind the apparently normal lens there appeared, like a curtain strung from the ciliary body, an irregular membrane, about *1mm* thick, which thrust a conical process, about *4mm* long and *2mm* thick, from a point a little below its centre, backward and downward into the vitreous, where it ended free. The space between this membrane and the choroid consists of a coagulated, in some parts brownish, in some parts grayish, mass. The choroid is not covered by the retina. The choroid is separated from the sclera in parts. The spaces between the two are empty. The optic nerve consists of a narrow band-like strip of tissue, not *1mm* wide, surrounded by ciliary nerves and vessels. At the optic entrance there is a conical plug of tissue, protruding *2mm* into the vitreous, with the apex toward the nerve.

The cornea and sclera showed nothing abnormal on microscopic examination. The iris is atrophic, and to a lesser degree the ciliary muscle. The ciliary processes are flattened and their epithelium is normal. The tissue which lies behind the lens consists largely of degenerated retina. There is nothing to be seen of nerve-fibres, ganglion cells, or rods and cones. Some of the nuclei in the nuclear layers can still be seen. There are many small vacuoles, a few well-stained round nuclei, and many irregularly scattered, faintly stained cells, which are undoubtedly degenerating. There are a few blood-vessels, partly thrombosed, and a few small hemorrhages.

Between the degenerated retina and posterior lens capsule there is a cicatricial tissue, rich in vessels and cells, firmly con-

nected with the retina, and passing into the process of retina, which is directed back into the vitreous. This process of retina contains many well-stained round nuclei, and many blood-vessels, whose continuity can be traced into the cyclitic membrane.

The lens is fairly normal. The equatorial nuclei are increased in number, and the epithelial layer covers almost the entire posterior capsule. A beginning posterior cortical cataract.

The larger portion of the choroid is normal. At the optic entrance it is separated from the sclera and passes into the tissue-plug, which is situated here. The pigment epithelium is attached to the choroid almost anywhere. Near the ora serrata there is one spot where the pigment epithelium is broken through by a small fresh hemorrhage.

The space between choroid and degenerated retina is filled in partly by coagulated exudate, and partly by the remains of old hemorrhages, shrunken red blood cells, round cells, free pigment, pigmented round cells, and a few fat cells.

In the optic nerve no nerve elements can be seen. It consists, especially in its scleral portion, of irregular cicatricial tissue, so that it can be recognized only from its topographic position. The central artery is thrombosed. The plug which runs from the optic-nerve entrance into the vitreous consists of an atypical cellular connective tissue, into which the choroid passes. Toward the vitreous the plug is covered by pigmented round cells and other remains of a hemorrhage.

The eye shows the changes of a chronic cyclitis, with detachment of the retina and separation of the retina and choroid from the optic disk.

The most noticeable condition is the peculiar tearing of the retina, which can be explained most readily by a traumatism.

Cases have been reported in which, through traumatism, either the optic nerve was torn out of the scleral canal, or the retina was torn from the nerve, but they were not like the present case. Michael's cases were caused by

injury with a sharp object, while in those due to a blunt force the nerve with the retina is torn out in a backward direction.

In the present case we must consider that by a fall on a stick or similar object the eye was forced forward, and the stretched nerve was torn out of the sclera and from the retina. The nerve need not have been torn entirely out of the sclera, there being sufficient closure of the scleral canal, so that the hemorrhage from the torn central vessels occurred into the ball and not behind the ball. This hemorrhage caused a detachment of the retina, with a moderate grade of cyclitis. The optic nerve atrophied and healed into the sclera, and, joining with the choroid, formed the connective-tissue plug which projected into the vitreous. The atrophy of the iris and the beginning cataract were due to the cyclitis.

The fact that there was no history of an injury does not speak against the possibility of an injury having occurred. The parents were not in a position to have watched the child constantly. The probability of an injury having occurred is rendered more likely from the fact of the cicatricial adhesions between conjunctiva and sclera, found at the operation.

Such an injury must, however, have been severe enough to leave traces which would have been noticed by the parents. But the parents are positive that the inflammation in the child's right eye did not begin until the beginning of February. This would leave a period of only three weeks between the time of the injury and the enucleation; entirely too short a time for the extensive degenerative changes in the retina and nerve, the formation of the extensive cyclitic membranes, and the atrophy of the iris to have occurred in. Consequently a traumatism alone cannot explain the condition.

The chronic cyclitis might have been going on for a long time without being noticed by the parents, and

have given rise to the cyclitic membrane and detachment of the retina. This would also explain the atrophy of the iris, retina, and optic nerve.

One might explain the separation of the retina from the disk by traction of the contracting cyclitic membrane. But this is not likely, since the membrane would not have a sufficiently firm support in the thin ciliary processes to have excited force enough to tear the retina. Moreover, the condition in the scleral canal speaks more for a tearing out of the nerve than for a gradual tearing away of the retina.

I consider it more probable that the already blinded eye received a traumatism, which caused the signs of inflammation that the parents noticed, and resulted in the tearing of the nerve from the sclera and from the already detached retina. It also caused the subretinal hemorrhage, as well as the adhesions between conjunctiva and sclera.

The cause of the cyclitis remains unexplained.

The parents thought that the right eye was smaller than the left at birth. But when seen by me both eyes were the same size.

The media were clear when the child was examined at 3½ months. Whether there was a congenital amblyopia or optic atrophy to explain the divergence I do not know.

Another interesting feature of the case is the fact that the cyclitis and detachment of the retina, without any previous history, can easily be mistaken for a glioma.

A similar diagnostic error occurred in the following case:

Therèse W., in January, 1894, at the age of two years, was accidentally struck in the right eye with a whip. Since that time she saw poorly with that eye. I first saw her on July 18, 1894. The right eye showed no inflammatory signs. A diagnosis of anterior capsular cataract and a choroidal rupture above and temporal to the disk was made. No treatment.

On September 23, 1897, I again saw the patient. The parents had noticed, in the last few months, a yellow reflex in the right pupil. Then the eye became inflamed.

The right eye showed moderate episcleral injection. The anterior chamber was filled *3mm* high with blood. The circumscribed anterior capsular cataract was unchanged. The pupil was dilated and had no reaction. From the vitreous came a reddish reflex. The fundus could not be seen. Intraocular pressure was slightly increased.

The left eye was normal.

Since there was no recent injury, and no cardiac or other general condition to explain the hæmophthalmos, and a connection with the injury of three years ago was not probable, the possibility of a vascular intraocular tumor was thought of as the cause of the hemorrhage.

Rest in bed and pilocarpin were ordered, as well as mercury inunctions, KI, and diaphoretics. The eye remained injected. The hyphæma disappeared for a time, but soon reappeared. The vitreous remained opaque, and tension increased. The child complained frequently of pain. On October 29, 1897, the eye was enucleated. Healing was normal. The eye was preserved in Müller's fluid, and examined a year later.

Section of the eye showed a detachment of the retina. Microscopic examination showed a normal cornea and sclera. Near the periphery of the cornea there is an increase in the number of nuclei. The episcleral and conjunctival vessels are dilated and filled with blood. The anterior chamber is shallow and contains the remains of a hemorrhage. The iris-angle is shut off by adhesions between the iris and sclera. The iris is atrophic, and its pigment layer is drawn about *1mm* on to its anterior surface. The lens shows an anterior capsular cataract and beginning opacity of the cortex.

The ciliary body is diffusely infiltrated with round cells. The ciliary muscle is atrophic. The ciliary processes are narrow, covered by normal epithelium, and embedded in a membrane, which passes from the ciliary body to the posterior surface of the lens, to the posterior chamber, and to the anterior portion of the choroid. The detached and degenerated retina is firmly adherent to this membrane. The choroid is thickened through round-celled infiltration, in some parts

diffusely, and in others in the form of nodules. No giant cells were seen; no bacteria. In the choroid, ciliary body, cyclitic membrane, and degenerated retina, there are many recent and old, large and small hemorrhages. The vessel walls show hyaline degeneration, sclerosis, and thrombosis. The optic nerve is atrophic. In its intrascleral portion there is a hemorrhage.

Of especial note is the fact that the detached retina is firmly adherent to a band of tissue 3–4*mm* wide, which springs from the thickened choroid to the outer side of the disk. This tissue band is soon separated from the retina, and passes downward and outward, and finally joins the retina and cyclitic membrane in the region of the ora serrata. At this point, the choroid is very much thickened, the pigment epithelium broken through, and the cyclitic membrane thickly strewn with pigment granules. The tissue band itself resembles the cyclitic membrane, and contains a branching mass of cartilage, starting from the choroid at its para-papillary origin, and extending for from 4–5*mm* into the band.

In the homogeneous ground-substance of the cartilage, there are round, oval, and spindle-shaped nuclei. In some cases, the cell protoplasm is seen. The cell is usually surrounded by an empty space. There is no trace of calcification. It is possible that a slight trace of lime might have been caused to disappear by the prolonged action of the Müller's fluid. The mass of cartilage is bounded in places by small pieces of necrotic tissue, with faintly stained granular ground-substance and a few well-preserved oval nuclei.

Two small islands of cartilage are seen in the middle of the choroidal tissue, below and outward, in the region of the equator.

All of these changes are best explained by the changes in the vessel walls, with the resulting numerous hemorrhages. This can explain the detachment of the retina, the cyclitis, the closure of the iris-angle, the atrophy of the iris, retina, and optic nerve. The formation of the tissue band coming out of the choroid is similar to what happens in cases of retinitis proliferans, and is probably due to hemorrhage from the choroid.

Especially marked is the diffuse chronic inflammation of the choroid. As there is a tendency to nodule formation, tuberculosis was thought of. But neither giant cells nor caseation were seen in the nodules. A staining for tubercle bacilli could not be made, because the eye was fixed in Müller's fluid.

There was nothing in the clinical or anatomical picture to suggest lues.

I believe that the numerous hemorrhages produced, by their degeneration, a chemical irritation, which resulted in an inflammatory thickening of the choroid.

The degeneration of the vessel walls probably had its origin in the old traumatism. We know that in isolated traumatic choroidal ruptures, degenerative processes keep on for a long time. So in this case, as the result of injury to the tissues and blood-vessels, there occurred progressive nutritive changes, which finally, with the occurrence of intraocular hemorrhages, formed a vicious circle.

The formation of cartilage in the eye seems to be comparatively rare, in contrast to bone formation. Outside of the cases of Knapp, Alt, de Vincentiis, Miauro, and Sgrosso, I have seen no reports in the literature. In the cases of Knapp and Alt, the cartilage occurred in choroidal sarcomata. Alt believes that enclosed masses of vitreous give origin to the cartilage. Miauro found in an atrophic ball islands of cartilage in the retina. He thinks they took origin from the supporting tissue of the retina. Sgrosso saw cartilage in a cyclitic membrane and in the inner layers of the choroid of a phthisical ball. He thinks it is due to a simple metaplasia of the tissue in which it is found, into cartilage.

In our case, the cartilage undoubtedly takes its origin from the choroid, and from the tissue which has grown out of the choroid. Both of the intrachoroidal islands lie in the midde of the choroidal tissue, and consequently can have nothing to do with vitreous or retina. They

are surrounded by a thick cellular infiltration and many small hemorrhages. This connection with old inflammatory areas, which is even plainer in the case of the cartilage in the choroidal tissue band, has led me to the supposition that the cartilage formation was a particular form of degeneration which occurred in previously inflamed tissues.

This theory would hold in all of the cases previously reported, since both sarcomata and phthisical balls show many degenerative changes. It is even possible that the necrotic area near the large mass of cartilage may be considered as a preparation to the formation of cartilage.

OLD AND MODERN BIFOCAL SPECTACLES.

By Dr. HERMAN KNAPP, New York.

(With 7 figures in the text.)

THE idea of the bifocals is due to Benjamin Franklin, who was born in 1706 in Boston, and died in 1790 in Philadelphia.

He put two horizontal half-spectacles together: (*a*) the upper, his distance-glass; (*b*) the lower and stronger, for near objects, as reading, etc.

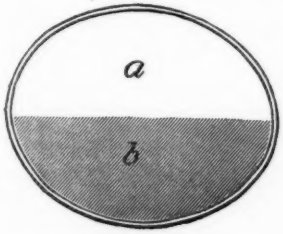


FIG. 1.

FIG. 2.

Emmetropes, when old, are apt to cut off the upper half and use the lower as a suitable near-glass. These simple devices have been much improved, especially in the last years. The principle is: "The difference between the far-glass and the near-glass, has to be added to the lower part of the far-glass."

My object is: to describe the current patterns. Some of them are constructed on new and interesting principles.

The most popular kind is the *distance-glass with a small magnifier pasted on the lower part of the distance-glass.*

This paster is not only conspicuous, but, by deterioration of the cement, lowers the transparency of the glass. To obviate this defect, the small lens is sunk into a concavity on the lower part of the far-glass, and its surface is even with that of the far-glass. It is kept in the concavity of the lower part of the far-glass with

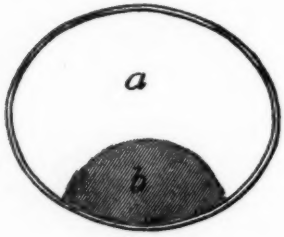


FIG. 3.

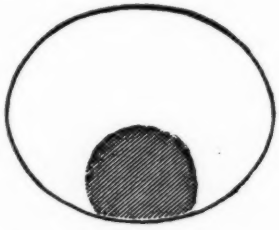


FIG. 4.

the finest cement, and when nicely polished it is not conspicuous; these patterns are styled "**invisibles**."

The **strengthening addition may also be bedded between two full glasses, which have their opposing surfaces touching each other.** One of them, or both, may receive enclosures with correction of the refractive errors. The presbyopes and the hyperopes require convex additions with strong refraction (flint-glass) on the lower part.

The **myopes** require concave additions with glasses of diminishing refraction and are put on the upper part.

The **myope** of 20″ has this as his neutral or far-point; further he cannot see clearly at a distance. He must have a glass of 20″ to see at long distances. His accommodation lets him see from 10″ to 20″. Without concave spectacles his accommodation lets him see to 10″. A middle or low degree of myopia should have its far-point of vision determined, and be allowed glasses of low or middle degrees.

In highest degrees it is prudent to remain below the far-point, especially if there is disease on the background.

Rest of the organ, besides other precautions to relieve the accommodation, is rational.

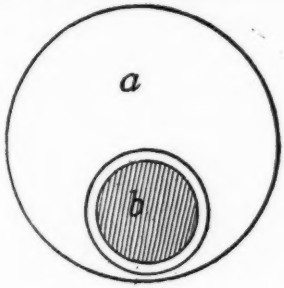


FIG. 5

FIG. 5. 1. Rough specimen. The crown-glass is perforated at *b*, where the flint-glass-cylinder reaches from one side to the other, and is ground on the same levels.

2. A variety of this kind with the difference that the cylinder does not pass through to the other surface but rests on a small crown-glass bottom.

Myopes without internal organic disease, and having fair vision, do best to choose their far-glasses, with diminished refraction on the lower part, like the hyperopes.

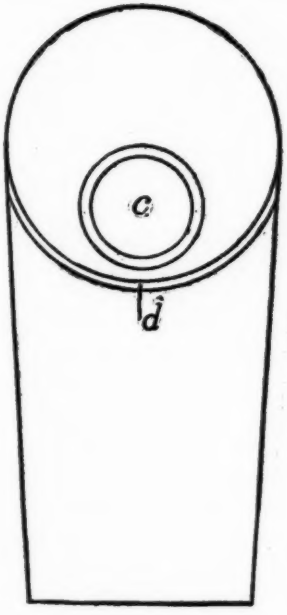


FIG. 6.

The *oven in which the flint-glass cylinder and the crown-glass mantle fuse together.*

c is the small lens which the optician observes whether the two kinds of glass melt.

d is a cleft through which he watches until the fusion is complete.

An **example** may perhaps be the best description.

A man in the twentieths has a myopia of $-\frac{1}{6}''$ (French measure, $36'' = 1$ m.). If he adds an enclosure: $+\frac{1}{12}''$ to his far-point $-\frac{1}{6}''$, he will read through the lower part, from $6''$ to $12''$, but with less strain. His amplitude of accommodation is $\frac{1}{12}''$ [$=3^{D}$]. In the upper half he can see well from $12''$ to ∞, at $12''$ with the greatest effort, and at ∞ in the relaxation of accommodation.

If we want to change *the location of the amplitude of accommodation*, our young man may be an example. He adds $+\frac{1}{12}''$ to his far-point $-\frac{1}{6}''$; it leaves $-\frac{1}{12}''$. He will read through the lower part of his glass, $-\frac{1}{12}''$. The far-point is now $-\frac{1}{12}''$, a good distance for near and far seeing.

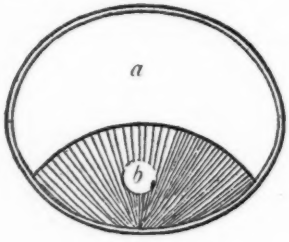


FIG. 7.

FIG. 7

a. The above part of the glass.

b. Lower part, made stronger by grinding the surface more convex.

The **myopes of low or moderate degree** require only a distance-glass; those of high degree should have glasses of their far-points. They should have magnifying additions in the lower part of their far-glass.

The optician, THEODORE MUNDORFF, of New York, has for many years manufactured bifocals which in sharpness of vision and durability of work are equal to the best that are now in the market. The glass shows a curved line, as he uses almost all the space on the lower half of the far-spectacle to get sufficient space for the near-sight. The area is like the small magnifiers which are pasted on the lower part of the far-glass. This increase of refraction is obtained by grinding the

outer surface of the lower half more convex, which, of course, has made the radius shorter and the refraction stronger.

I have worn a pair constantly for six or seven years. It has given me perfect satisfaction. The curved line, separating the near-glass from the far apart, is the only visible line. Projecting over the deeper lower part, there is scarcely any accumulation of dust. I had no difficulty to keep it clean.

The latest and the best is the bifocal of BORSCH of Philadelphia. He fastened the small flint-lens in a concavity or a whole perforation of the distance-glass, not with any cement, but the small addition to the far-glass, well corrected of refraction errors and carefully fitting to the concavity on which it was pressed. It was not cemented, but with an **identical material (glass)**, Figs. 5 and 6, he made it fluid with its case, by fire. He took a small oven into which he put the lens and made it melt by intense heat, through electricity or lighting gas. The oven had a cover, which left a small cleft through which he watched the glass, and when both parts were fused to one mass, he removed the fire; after which he could also correct an astigmatic error on the open surface, but the other end of the enclosure, which had been corrected before, was put into the hole, and impressed its relief into the softer glass, as the optician looked into the oven and saw that the glass and its mantle were evenly fused together.

The enclosure was of **flint-glass,** which is denser and more refractive than the crown-glass.

The optician as a rule gets a **prescription from the oculist as the pharmacist from the physician.** Yet the optician can arrive at such prescriptions if he has to deal with a patient whose eyes and brain are free from organic defects. The eye, however, has many diseases which are difficult to find out and appreciate. I should advise the optician to consult the oculist when he, by

glasses, fails to get full acuteness of vision. The oculist is also more expert to recognize the multitude of nervous and cephalic diseases. The best field for the optician is the uncomplicated astigmia, and this occurs in a very large number; also old age, though that is much complicated. Astigmia is present in every eye, and the correction can be recognized without trouble and mistake. The trial case is mostly sufficient to recognize its presence, kind, and treatment. Many people do not see well, and the optician's apparatus will not be competent to recognize the defect, much less to indicate the treatment.

I beg to end this paper with a little controversy which I had with Prof. Donders in my student-years, in 1859, when I worked in Helmholtz's laboratory on the *Curvature of the Human Cornea*. At that time this was very onerous. I found the differences of the radii and, of course, those of the meridians. At the meeting of the German Ophthalmologic Society at Heidelberg, I communicated the results and said that this asymmetry might be the cause of the astigmia. Donders opposed. He said that could not be, as Thomas Young, who was astigmic, annulled the effect of the cornea by putting it behind water, but his astigmia remained the same. I replied, that Thomas Young might have other causes for his astigmatism. There was no discussion.

REPORT OF THE OPHTHALMOLOGICAL PROCEEDINGS OF THE BRITISH MEDICAL ASSOCIATION, ANNUAL MEETING, 1907, HELD AT EXETER.

By Mr. C. DEVEREUX MARSHALL.

WEDNESDAY, JULY 31, 1907. L. H. TOSSWELL, M.B., PRESIDENT, IN THE CHAIR.

AFTER some opening remarks by the President, Professor Landolt (Paris) opened a discussion on the **form and manipulation of instruments used in ophthalmic surgery.** He said he felt it rash on his part to come and talk of ophthalmic surgery in a country which still possesses such masters in the art but it was for this reason he had selected his subject. Although we did well to follow in the wake of the general surgeon, yet with regard to operative technique we could emancipate ourselves from the old methods, and evolve new ones more suited to our particular province. He considered that many of the instruments now in use retained the design and form given them by the general surgeon, and were not so well adapted to our purposes as they might be, due to the fact that ophthalmic operations differed so much from the operations of general surgery. The eye was the most movable organ in the body and the most difficult to fix, and yet the operation on it demanded mathematical precision in execution. In order to attain this, the finger tips should be brought as close as possible to that portion of the instrument which has to do the actual work. The requisite movements should be performed by the fingers themselves, and not by the wrist or arm, and the minimum of muscular effort should be employed. A heavy or

slippery handle, or forceps with too strong a spring, would detract from the fineness of the execution. In most small scalpels the blade was too long, and at too great a distance from the handle. He then showed patterns of knives which he considered correct, and compared them with others of an incorrect pattern. In the former, one could almost obtain the sensation of operating with one's own fingers, and the resistance of the tissues could readily be appreciated. Cataract knives were generally well made, but makers usually separated the blade from the handle by a shaft which was too long. The same applied to keratomes. As a rule a shaft of 35*mm* was given, when one of 22*mm*, or 20*mm* would be far better. The blade, also, should be curved. The shafts of Pagenstecher's and Taylor's spoons were far too long for delicate handling. The same was true of cystitomes, curettes, and spatulas. Ivory was an ideal material for the handles of instruments, and it was, in reality, not so much the ivory as the cement used to fix the blade which would not stand the heat of sterilization; and this could be overcome by screwing the blade in, instead of fixing it in the usual manner. Steel and aluminium handles were well enough for the large knives of general surgery, but they were nothing like so satisfactory for eye instruments, as they were, as a rule, too heavy, and did not adhere to the fingers like ivory, and consequently a greater muscular effort was necessary when using them. He had never found a handle too short, but frequently they were made much too long.

Many forceps had the spring too strong and the blades too weak. We required light springs and strong blades, and the portion below the grip should be shortened by about 10*mm*; while the teeth, instead of being placed at right angles to the blades, were much better if placed obliquely, and perpendicular to the surface required to be seized. The ordinary forceps secure an inefficient hold of the tissues, and in order to remedy this longer teeth were recommended.

He described the correct method of holding scissors, which should be proportionate in size to the hand of the operator; so often the handles were too long and too delicate, while the blades should be strong and not too pointed.

Much the same principles should be applied to other

instruments, which all depended upon the fundamental rules in handling them.

Mr. JESSOP agreed with the points raised by Professor Landdolt. The curvilinear keratome was a very useful instrument and the cross-bill forceps were very handy, especially in advancement cases.

Dr. GROSSMANN thought that the length of the blade and handle of knives would necessarily vary with the operator. Straight-edged keratomes were easier to sharpen than curved ones. He thought, as regards forceps, it was an excellent plan to have the teeth fixed at an angle of 45 degrees, and he had had for the last 25 years such an angle introduced on epilation forceps.

Mr. SIMEON SNELL (Sheffield) read a paper on **An enquiry into the causes of blindness in 333 inmates of the Sheffield School for the Blind.** In this school, he said, there were 70 inmates. At first there were fewer patients as only completely blind children were admitted, but since the Education Act of 1893 a proportion of not altogether blind patients had been received, for by this Act the term "blind" meant "too blind to read the ordinary school-books used by children." These, however, formed but a very small proportion of the cases, and, with rare exceptions, for the purposes of this paper, all cases could be considered as blind in the ophthalmic sense. Of the 70 inmates, half were males, and half females. At first all the children came from Sheffield, but since 1893 they had been coming from a very wide area. There were at present 20 from Sheffield, and 50 from the surrounding parts of England. Ophthalmia neonatorum provided no fewer than 136 out of 320 cases, or 42.36%; and in recent times there did not appear to be any diminution from the ravages of this disease, which was still rampant, notwithstanding the efforts made to stop it, and the fact that it must be regarded as a preventable disease, and when present it could almost always be successfully treated. Although the medical profession were alive to its importance, yet much was needed to bring the truth home to midwives, in whose practice these cases mostly occurred. He had not found, in his practice, that the disease was less frequent than formerly.

Ulceration of the cornea, other than as the result of

ophthalmia neonatorum, was the cause of seven cases, or 2.18%.

Trachoma caused only one case, or .31%.

Interstitial keratitis caused 10, or 3.11%.

Sympathetic ophthalmitis was the cause of blindness in 22 cases, or 6.85%; 4 were boys, and 8 girls; 13 were injured in the right eye, and 6 in the left, while in three the injured eye was not specified.

Of congenital cases, anophthalmos gave 3, or .93%. Hydrophthalmos gave 5, or 1.55%; microphthalmos, 6 cases, or 1.86%, and in one of these there was a coloboma of the iris and choroid. There was one other case of coloboma below. There was one case each of albinism and nystagmus. There were 30 cases of congenital cataract, or 9.3%; 8 girls, and 22 boys, and in one the globes had been destroyed after operation, apparently from suppuration. Operations had been done in 23 of the cases, and some admitted of further operative interference. In two or three cases further operation had been successful, but the vision was very defective owing to optic atrophy. Seven cases were of lamellar cataract, which had not been operated upon, and these were all suitable cases for surgical interference.

Congenital blindness due to retinal and choroidal disease and optic-nerve atrophy, produced 20 cases, or 6.23%. He gave the family history of most of these cases.

Small-pox produced 4 cases, or 1.24%. None of the 4 showed any sign of vaccination.

Scarlet fever caused 9 cases, or 2.8%, and in one case there was optic atrophy.

Measles produced 11 cases, or 3.42%. German measles, whooping-cough, and enteric fever, 2 cases each, or .62%.

Optic atrophy from brain disease caused 35 cases, or 10.9%.

Injury to the head caused 7 cases, or 2.18%.

There were 2 cases of glioma in both eyes, or .62% Refractive errors produced 2 cases, or .62%, but both of these were capable of much improvement with glasses.

There was only one case of malingering.

Only 8 cases were excluded from this report owing to insufficient information about them.

Mr. SYDNEY STEPHENSON remarked upon the large number

of children blinded by ophthalmia neonatorum (42.36%), and as most, if not all, of these cases could have been saved, he moved the following resolution:

"That in the opinion of the Section of Ophthalmology, the time has come when action should be taken by the British Medical Association towards the prevention of ophthalmia neonatorum."

This was seconded by Dr. GROSSMANN, and carried unanimously.

Mr. JOHN HERN (Darlington) said that most of the cases of ophthalmia neonatorum which came under his notice had been attended by midwives, and as more cases were now handed over to these women, so more cases of ophthalmia neonatorum would develop. He thought that the brain cavity should be opened in cases of intracranial pressure as a means of relieving optic neuritis and preventing it passing on to optic atrophy.

Dr. TROTTER (Perth) said that ophthalmia neonatorum was diminishing in his district. He had seen only one case in four years in hospital, and none in private. This he attributed to the use of 2% silver-nitrate solution applied to the eyes after birth, and to the absence of a Midwife Bill.

Mr. CECIL SHAW (Belfast) said that the source of such cases he had lately seen was the too vigorous action of prophylactic measures carried out by midwives.

Dr. ERNEST THOMPSON (Glasgow) had recently gone into the question of the prevalence of ophthalmia neonatorum in cases treated in the Glasgow Eye Infirmary, and he had proved that during the last fifteen years there had been no appreciable diminution of the disease.

Mr. RICHARDSON CROSS (Bristol) said that in all schools for the blind ophthalmia neonatorum provided the largest number of patients, though for years it had been known as an absolutely preventable disease. In many cases blind from cataract the condition was complicated by abnormal brain development. He thought that, where practicable, a wounded eye in a child should be saved, so that the orbit should not atrophy, but such cases should be very carefully watched, as sympathetic ophthalmitis was sometimes very quiet in its onset and might be overlooked for some time. Trephining, he thought,

should be done in cases of optic neuritis due to intracranial pressure.

Mr. SNELL replied.

Dr. HENRY MANNING FISH (Chicago) read a paper on **The relation of diseases of the nasal accessory sinuses to optic neuritis.** He based his paper on thirty-six consecutive cases of optic neuritis in which nasal accessory-sinus disease was present twenty-six times. Improvement followed treatment of the sinus disease in fifteen cases, including three bilateral cases, which were restored to normal. In spite of many published cases, this cause of optic neuritis appeared to be still doubted by some authors. He had found about 100 published cases of both primary and secondary optic neuritis, with all degrees of visual disturbance, from slight optic neuritis with no reduction of vision, to total loss of light perception. These cases further showed that disease of the air sinuses of the head and face could cause optic neuritis owing to extension from them. He recounted several cases in which the vision was restored or much improved by opening the affected sinuses. The most common type of acute sinusitis was a cold in the head, accompanied often by a greenish nasal discharge. Chronic sinusitis might remain dormant for months or years, and suddenly become manifest at any time. Involvement of the external ocular muscles was present in 33% of the cases. Out of thirty-six consecutive cases he had found sinus disease present twenty-six times, and in fifteen cases improvement of the ocular condition followed drainage. The eleven cases in which no improvement followed he attributed to the same cause, though he admitted that some unknown ætiological factor might be present in some of the cases. He considered that idiopathic facial erysipelas when the optic nerve was involved was but an evidence of streptococcic or staphylococcic infection of the buccal, aural, or nasal cavities. Syphilis frequently caused sinus empyæma. He described a number of cases in patients suffering from different diseases in which drainage of the affected sinus caused relief of the symptoms, including several cases of glaucoma. He concluded by instancing the case of the late Dr. Javal, who was blind from glaucoma for several years before his death. He thought that had treatment been directed towards drainage of the nasal sinuses

in place of the repeated operations on the eye, all of which were in vain, he might have retained his sight to the end. He wished to emphasize the fact that an absolutely negative nasal finding did not exclude accessory-sinus disease, and he was convinced that sinus disease was one of the most frequent causes of optic neuritis.

Mr. RANSOM PICKARD (Exeter) said that he had recently had a case of bilateral optic neuritis (not retrobulbar) accompanied by purulent discharge from above the middle turbinates. The neuritis subsided and the vision improved after the discharge from the nose had ceased.

Dr. REBER (Philadelphia) thought that the diagnosis of lateral accessory-sinus disease was extremely difficult and called for the highest technique. Although he did not think that double optic neuritis was often due to sinus disease, yet he considered that unilateral optic neuritis was frequently due to a local cause. He mentioned two cases.

Dr. CHICHELE NOURSE said that, as a rhinologist, he greatly appreciated Dr. Fish's paper, and he had done good in pointing out a field of work which would doubtless prove fertile in the future.

Dr. DYKES BOWER (Gloucester) entered a plea for the more systematic examination of the nasal cavity by ophthalmic surgeons. He, however, did not think that the association of ophthalmic diseases and nasal diseases was very common.

Dr. FISH replied.

Dr. CARL GROSSMANN (Liverpool) showed a **portable refractometer and astigmometer,** consisting of lenses arranged in a rectangular frame, which was held in front of the patient's face for doing retinoscopy and for testing vision with test-types. The cylinders had a mechanism for revolving them and placing their axes at any required position. He also showed an improved form of artificial eye.

THURSDAY, AUGUST 1, 1907. L. H. TOSSWILL, M.B., PRESIDENT, IN THE CHAIR.

Mr. RICHARDSON CROSS (Bristol) opened the discussion on **irido-cyclitis.** He first briefly discussed the anatomy and physiology of the ciliary body, and then went into the pathological results noticed in disease and inflammation of it, from a simple

catarrh, which as a rule got well, to the more violent form of cyclitis and choroiditis. As regards tension, this was usually low at first, but in severe cases it soon became raised, and finally, from atrophy of the tissue, it fell again.

Irido-cyclitis was usually the result of constitutional dyscrasia, depending on organisms, an incident in general infection rather than a disease, such diseases as syphilis, tubercle, and rheumatism producing it. It was sometimes seen in albuminuria and diabetes, and might complicate the toxæmia of gastro-intestinal or vaginal inflammations, or be caused by pyorrhœa alveolaris; or sepsis in the nose and accessory sinuses and, finally, wounds were a frequent cause.

The treatment was next mentioned, and the use or otherwise of subconjunctival injections was discussed. Mydriatics were essential, and the increased tension due to exudation was sometimes at once relieved by it. There was no sound reason for myotics, even when the tension was high, as paracentesis followed up with atropin was the correct treatment, and, besides lowering tension, paracentesis encouraged the flow of antibactericidal substances from the blood into the aqueous, and also allowed the escape of bacteria, toxins, and unhealthy secretions. It was sometimes of use even when the tension was low, and it could be repeated without fear of danger. At times, iridectomy might be required, but it should not be done during the acute attack, but after the eye became quiet. He admitted the great value of iridectomy in lessening the attacks, or even in arresting the disease, and also in improving the nutrition of the eye. The cause of the disease should be carefully sought for and treated, for without it local remedies alone were unlikely to bring about a cure.

Mr Holmes Spicer said that as regards rheumatic iritis, he had seen it produced by the injection of the rheumatic streptococcus in animals, but the appearance of the iritis was very different from the ordinary rheumatic iritis which was so commonly seen clinically. The experimental variety closely resembled that seen in pyæmia. In chronic cases iridectomy did but little good, as the coloboma closed afterwards, but in recent cases it was most valuable. He thought that eserin was to be avoided in all these cases.

Mr. J. Herbert Parsons confined himself to the pathology,

ætiology, and treatment of the disease. In the absence of other evidence of infection, the intestinal tract was probably the source of mischief, and he thought that calomel should be given, and should be followed up by intestinal antiseptics, e.g., napthol, guaiacol carbonate, etc. Locally he had seen excellent results from dionin, and the deposits on the back of the cornea (keratitis punctata) had cleared up in a remarkable manner. He deprecated paracentesis, as he considered it wrong theoretically, and relatively unsatisfactory in practice. He relied largely on prolonged and energetic treatment with hot baths, diaphoresis with pilocarpin, mercurial inunctions, potassium iodide by the mouth, etc.

Mr. ROPER (Exeter) said he should wait from six to twelve months before doing iridectomy. Mercury inunctions were of the greatest use, and he was much impressed with the action of iodipin.

Mr. HERN (Darlington) seldom did iridectomy in sympathetic cases, for the coloboma usually closed again, and in the end the condition was rather worse than before.

Mr. DEVEREUX MARSHALL quite agreed that the use of atropin was essential, and if the tension was high he should do paracentesis. Eserin was wrong theoretically, and never did anything but harm in these cases.

Dr. REBER (Philadelphia) thought the general state producing the condition was very apt to be overlooked by ophthalmic surgeons. Such patients should be briskly purged with calomel, and this should be followed up with a course of mercury. In rheumatic affections, subconjunctival injections were of little value, but were often useful in the quiescent stages of plastic iritis. Later on he advocated iridectomy, followed up with mercury internally and subconjunctival injections.

Lieutenant-Colonel HERBERT (I. M. S.) referred to plague as a frequent cause of destructive irido-cyclitis in India, often leading to perforation of the sclerotic in the ciliary region. Mercury was most useful internally in nearly all cases. If tension was present, one properly performed tapping usually reduced it permanently. He entered the knife on one side of the anterior chamber, made a counter-puncture on the other side, but only through the sclerotic and not through the conjunctiva; by slightly twisting the knife the aqueous escaped

subconjunctivally. In older people many of these cases were closely allied to primary subacute glaucoma.

Mr. Cross replied.

Lieutenant-Colonel Herbert (I. M. S.) read some **clinical observations on spring catarrh,** in which he analyzed thirty-nine cases seen in Bombay during two and one-half years. Only seven of the patients were females, and no patient was above forty years of age. The older patients had the milder attacks. In one case, a youth æt. twenty-one, who had suffered from the disease since childhood, the vision was much reduced by invasion of the cornea. The patients were of all races, including Europeans. No cases were seen during May, the hottest month, and most occurred during July, the wettest month, though all months other than May produced some cases. He then entered fully into the differential diagnosis of the disease. In cases of doubt, the diagnosis could always be settled by the presence of eosinophiles in the membranous discharge, these cells being found in enormous numbers, but unevenly distributed, though freshly formed exudation should always be taken, owing to the ease with which the cells break up. Fluorescin staining points, as described at the Swansea meeting of the Association a few years ago, were numerous and characteristic in some limbus thickenings. Sometimes there was slight nasal catarrh present, and fresh mucus from the nose sometimes contained eosinophiles.

Treatment was not satisfactory, nor uniform in results, which pointed to the author's belief that the conjunctivitis is only a part of a diffuse malady. He generally used a saturated solution of salol dissolved in almond oil, instilled six times a day.

Mr. Sydney Stephenson alluded to the coincidence of a skin affection with spring catarrh, and probably the two conditions were of the same origin. He thought the diagnosis was difficult only when one eye was affected.

Mr. Richardson Cross (Bristol) said that the disease was rare in the west of England. He had seen a typical case in a boy aged fifteen, and he was always worse in the spring and hot weather. Another case occurred in a gentleman thirty-five or forty years of age, but this was not so typical as the former case, and he felt some doubt as to the diagnosis.

Mr. J. H. Parsons though that the experience at Moorfields

was that the disease was rare in England, though doubtless some cases were mistaken for trachoma. He doubted if the presence of eosinophiles was absolutely pathognomonic.

Colonel HERBERT, in reply, thought that the disease was probably commoner than was suspected, but he considered that the character of the cells in the discharge was conclusive evidence of the disease.

Dr. HILL GRIFFITH (Manchester) read notes of a case of **orbital thrombosis** which proved fatal. The notes were by Dr. ERNEST SMITH (Hyde). The patient was a man aged twenty-five, who, after working on a roof all the afternoon, had to lie down afterwards on account of pain in his eyes. He had nose-bleeding. The pain got worse the next day, and the eyes became swollen. Three days later, the left eyeball was prominent, and the skin red and œdematous. This got worse, and two days later the right eye became affected. The fundi were normal. The diagnosis was made of orbital and sinus thrombosis. The patient died on the eighth day of the illness. An autopsy could not be made, but the diagnosis of sinus thrombosis was made with certainty from the fact that protrusion of the second eye took place, and that there was œdema of the mastoid region. Dr. Hill Griffith had previously published a similar case, in vol. iii. of the *Ophthalmic Review*, 1884.

Mr. J. HERBERT PARSONS said that distension of the retinal veins did not take place in this condition, as was usually stated, and PERCY FLEMING had noticed that the first sign of involvement of opposite sinus was paralysis of the sixth nerve of that side.

Dr. JAMES HINSHELWOOD (Glasgow) reported four additional cases of **congenital word-blindness** occurring in the same family. These children all had the greatest difficulty in learning to read, and could not recognize words when they saw them written or printed. The first case was a boy, aged twelve, who could not recognize all the letters, and was quite incapable of reading even monosyllabic words. The second, aged fourteen, had been at school for nine years, and although quick in all other school subjects, including arithmetic and writing, he was word-blind. He was now slowly improving, and could read short words if allowed to spell them.

The third case was a boy, aged eighteen, who was at school for seven years, and left without being able to read even a child's first primer. His arithmetic was excellent. Since leaving school he had taught himself to read football news, but could scarcely read anything else. The fourth patient was sixteen years of age, and was nine years at school. He left without being able to read, and had now quite given up any attempt to do so. He insisted on the necessity of educating such children alone, for in classes and ordinary schools they would never improve.

Mr. HOLMES SPICER had seen a case two years ago complicated with astigmatism and a high refractive error. He expected he would improve after correction, but he had since heard that he could not read at all. Doubtless it was a case of congenital word-blindness.

Mr. ELLIOT SQUARE (Plymouth) had reported a case of a coachman, aged fifty, who had never been able to read, not even the names of streets, and consequently he made great mistakes in new neighborhoods. If sent to pay bills, he was always able to do it well, and never made mistakes with the change.

Mr. SYDNEY STEPHENSON mentioned the case of a family of eight, in which three girls and one boy suffered from congenital word-blindness.

Mr. CYRIL WALKER commented on the great similarity of all the recorded cases, and said that minor degrees of word-blindness seemed to be relatively infrequent. He instanced the case of a boy, aged ten, who, though excellent at arithmetic, was almost incapable of reading.

Mr. R. J. COULTER read a paper on the **treatment of alternating squint.** The first case he recorded was that of a boy, aged fourteen, who commenced to squint when four years of age. His refraction was R. $+3.5$, L. $+2.75$, and vision of both eyes perfect. An attempt was made to restore binocular vision by orthoptic treatment, but no fusion was possible. After an advancement and tenotomy, good fusion and stereoscopic vision were obtained. He reported four other somewhat similar cases. He had notes of four other cases in which he had failed to restore binocular vision of such a quality as to keep the eyes straight, but he had never failed to obtain fusion

of stereoscopic pictures after correcting the deformity by operation. In dealing with alternating squints he considered the best course was to correct the deformity by operation, and, as soon as possible, to start training with the amblyoscope or some other form of stereoscope, and that the most suitable age for undertaking this treatment was between twelve and sixteen years.

FRIDAY, AUGUST 2, 1907. L. H. TOSSWILL, M.B., PRESIDENT, IN THE CHAIR.

Mr. HOLMES SPICER opened the discussion on **vesicular affections of the cornea.** He first entered into the anatomy and physiology of the corneal epithelium, and noted the fact that it could so easily be stripped off Bowman's membrane. In reptiles which periodically cast off their epidermis the epithelium of the cornea was cast off too, and its periodic detachment in bullous keratitis might be a repetition of this process. Examples were given of its general and partial exfoliation. Even in normal corneæ its sensitiveness varied markedly, but when ulceration was present, pain reflex was often defective. This was frequently the case in the other eye, which had no ulceration. In some cases, instead of a superficial affection, deep or interstitial keratitis, iritis, cyclitis, and diminished tension might occur. These were of trophic or of nerve origin. The same sort of thing might occur in the terminal branches of the nerve, as well as in the nerve trunk, such, for instance, as febrile herpes, dendritic ulcers, and filamentary keratitis.

In febrile herpes the skin was mostly affected about the lips, etc., but it might occur on the cornea. A case was mentioned in which a patient had suffered from numerous dendritic ulcers of the cornea. He got an attack of febrile herpes on the nose, followed by a large crop of corneal vesicles.

Filamentary keratitis was considered to be a form of herpes, the filaments being epithelial cells twisted up like a rope.

Dendritic ulcers were next discussed, and their treatment mentioned. Relapsing bullous keratitis was next considered, and the unsatisfactory nature of the treatment was remarked on. The best plan was to remove carefully all traces of loose epithelium and to secure rest by a compress of atropin. Caustics and other measures frequently failed to prevent relapses.

The free use of dionin had done good, but Mr. Spicer urged the necessity of removing the epithelium at the site of the bulla, down to the basement membrane. The general health had carefully to be attended to and restored to normal vigor.

Superficial punctate keratitis was discussed, and it was considered as belonging to a separate group, and to be a catarrh of the whole conjunctiva, which was found to have its own organism.

Dr. JOHN CROPPER (Jerusalem) called attention to a condition seen in bad cases of trachoma with much infiltration of the cornea by trachomatous tissue. The cornea became gray and infiltrated, and the condition generally led to blindness. In such a case in Palestine he had had an excellent result with the actual cautery.

Mr. RANSOM PICKARD said that the behavior of cases of relapsing bullous keratitis suggested that during healing micro-organisms might get enclosed beneath the epithelium. It would be worth while, in cases of injury from obviously septic things, such as a baby's finger nail, a twig, etc., to treat the abrasion by scraping, or the application of strong antiseptics.

Dr. DE SILVA (Colombo) read a paper on **lepra ophthalmia in Ceylon.** The leper asylum there contained now 500 cases, and of these 101 suffered from eye symptoms. He examined all these cases, and found that 23 suffered from lepra tuberculosa, 33 from lepra anæsthetica, and 45 from lepra mixta. The most important lesion in the lepra tuberculosa was a tubercular episcleral growth, which usually started on the outer circumcorneal region, and it took months to involve the cornea, while the pupil showed a tendency to be irregular and to be dragged towards the nodule. The average duration of these cases was 9 years. The vision remained remarkably good, and in five cases only was the sight materially affected. Lepra anæsthetica had an average duration of 14 years. The patients were older and the disease lasted longer, one patient being 87 years of age, and he had had the disease 45 years.

Most of the corneal complications occurred when there was lagophthalmos, due to paralysis of the facial nerve.

He concluded that the commonest specific lesions were found only in lepra tuberculosa, but the percentage was small. In lepra anæsthetica there was no primary lesion in the eyes.

The few cases there were of cataract did not show a greater percentage than in the same class of people in Ceylon generally. He then gave details of 17 typical cases.

Mr. A. FERGUSSON MACCALLAN gave an interesting account of the **origin and present organization of the ophthalmic hospitals in Egypt.** The hospitals were founded in 1903 by Sir Ernest Cassell, G.C.M.G., who gave £41,000 for the ophthalmic relief of the necessitous inhabitants of Egypt. A travelling ophthalmic hospital was organized, and Mr. MacCallan was appointed ophthalmic surgeon and inspector. His duties were to organize and administer an ophthalmic hospital, and to train in ophthalmic surgery Egyptian doctors attached to it. On his arrival he made a tour of the Egyptian Delta, and at each town he treated many cases, and familiarized himself with the condition of work which would have to be carried on. The operations and treatment were performed and carried out in tents, and about a third of the cases required operation, while about 40% had trachoma. He then described the usual daily routine. The scheme was a complete success, and there never was the slightest hesitation on the part of the people to visit the hospital, nor to submit to any operation which might be proposed.

Owing to the further liberality of Sir Ernest Cassell a second hospital had been established, and now one works in Upper Egypt and another in Lower Egypt. The Egyptian Government had since adopted the policy of building ophthalmic hospitals, one or more yearly, as funds permitted. He hoped that in the course of 14 years they would have a special ophthalmic hospital in the capital towns of each of the 14 provinces of Egypt.

During the year 1906, 40,103 patients were examined at the hospitals, and of these, 7327 were admitted for treatment either as in- or as out-patients; 5846 operations were performed on 2649 patients; 8% of patients had trichiasis or entropion. Cataract and glaucoma were common. He then described some of the operations he commonly performed, and gave his opinion as to the best treatment for certain diseases. After this, he showed some most interesting lantern slides illustrating the way in which work was carried out in the travelling hospitals.

Dr. JOHN CROPPER (Jerusalem) congratulated Mr. MacCallan on his excellent work, and thought that such work was calculated to do an immense amount of good, not only to the patients, but it would act as a means of reconciling the people to British rule.

Mr. C. A. ROPER (Exeter) read a paper on **prolapse of the iris in simple cataract extraction.** He said that at the Exeter Eye Infirmary it had been the practice for 30 years to do the simple operation, and only to do iridectomy in exceptional cases. The late Mr. Boukart, whom he (Mr. Roper) succeeded, was an unswerving champion of the simple operation. He described the operation as he usually performed it, and said that if on the third or fourth day prolapse of the iris took place and was extensive, he should remove it, but if it were only slight, he should leave the cure to nature, and possibly excise the cystoid scar later if it were causing irritation. He described a typical case, and stated that he had seen no case of irido-cyclitis or suppurative infection following a prolapse.

Mr. DEVEREUX MARSHALL said he frequently did the simple operation, but he never would leave an iris unless it went back perfectly, as such cases always prolapsed within a few hours. What he considered the great advantage of the simple operation was the fact that the capsule was less likely to get drawn up to the wound than if an iridectomy were done. He spoke strongly in favor of removing a prolapse at the earliest possible moment.

Mr. R. J. COULTER (Newport) preferred a peripheral incision to one in the cornea, and had seen four cases of prolapse with the former section. He would prefer to excise all prolapses.

Mr. BREWERTON thought that for a prolapse to occur on the seventh or ninth day was most extraordinary. The chief danger of prolapse was, in his opinion, the likelihood of the capsule being brought up and included in the wound. He considered a prolapse of the iris after cataract extraction as one of the most fertile sources of sympathetic ophthalmitis.

Mr. ELLIOT SQUARE (Plymouth) thought that one of the great advantages of the simple operation was the cosmetic

effect, and in order to make the eye look as nice as possible it was sometimes desirable to avoid iridectomy.

Mr. ROPER replied.

Dr. THOMSON HENDERSON (Nottingham) read a preliminary communication on the **pathogenesis of glaucoma and the rationale of its treatment.** He held that the causal factor of glaucoma existed in a primary obstruction and closure of the pectinate ligament, due to sclerosis of the fibrous structures about the filtration area. All other changes were secondary to this. He then went into the anatomy and physiology of the parts involved. The hindrance to the aqueous outflow did not arise from the peripheral anterior synechia so frequently met with in glaucoma, which he looked upon as secondary only, but it was caused by the closing of the interspaces of the pectinate ligament in consequence of the fibrosis of the cells of its connective-tissue stroma, and formation of a homogeneous membrane around these fibrous bundles, leading to the endothelial cells being just brought into contact and then welding together the fibrous structures. The iris, in addition, was not only a diaphragm, but an absorbing surface accessory to the pectinate ligament, and when the latter was obstructed, the iris had to do the whole of the drainage. When the pupil became dilated, its area was lessened, and the crypts near the pupil were closed; thus the blocking of the angle of the anterior chamber was a consequence of the acute iritis œdema, and not the cause of the glaucoma. The œdema of the ciliary body relaxed the suspensory ligament, thus allowing the lens to become more globular, and consequently causing shallowing of the anterior chamber. By modification of these processes, acute, subacute, and chronic glaucoma were explained.

The reason why myotics caused diminution in tension was because the crypts in the surface of the iris became open and the aqueous was able to find its way out. Mydriatics did the reverse of this. After an iridectomy, the stump of the iris showed no signs of healing, and even years afterwards the appearance of the cut edges was as if it had been done post-mortem, and thus the operation opened up permanent channels for the fluid to drain away, and would always be effective unless the iris tissue was too atrophied and degenerated.

Mr. PARSONS thought that too much stress had been laid upon the absorption function of the iris in Dr. Henderson's theory, and he was doubtful whether this was not a secondary rather than a primary cause of the glaucoma.

Mr. RICHARDSON CROSS gave details of a case which supported Dr. Henderson's theory.

Dr. HENDERSON replied.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE SECOND QUARTER OF THE YEAR 1906.

By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and Others.

Translated by Dr. MATTHIAS LANCKTON FOSTER.

Sections VIII.– XII. Reviewed by DR. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

506. BRÜCKNER, A. **Congenital epicanthus.** *Arch. f. Augenheilkunde*, lv., 1 and 2, p. 23.

507. CABANNES, C., and LAFON, CH. **Adenoma of the Meibomian glands.** *Archives d'ophtalmol.*, xxviii., p. 422.

508. LASPEYRES, K. **Angiolipoma of the eyelid and orbit.** *Zeitschr. f. Augenheilkunde*, xv., 6, p. 527.

509. VON MICHEL. **Adenoma of the lid and a rare form of adenoma, the hydroadenoma papillare cysticum.** *Festschr. für J. Rosenthal*, Leipsic, 1906, G. Thieme.

BRÜCKNER (506, **Congenital epicanthus**) has observed two cases of congenital epicanthus, one palpebral, the other tarsal, both associated with paresis of both abducens and superior recti, and with ptosis. As epicanthus is due to an arrest of development—such folds are in the embryo in the third month—it is often to be looked upon as a sign of degeneration, as illustrated by one of the cases, and is frequently associated with psychical disturbances. His second case was one of mongolioid idiocy.

CABANNES and LAFON (507, **Adenoma of the Meibomian glands**) observed a case of adenoma of the Meibomian glands which presented the clinical symptoms of a chalazion of the lower lid. Its nature was first determined by the anatomical investigation. This localization of an adenoma is exceptional: only one other case, that of Baldauf, has been recorded.

BERGER.

According to LASPEYRES (508, **Angiolipoma of the eyelid and orbit**), extravasations took place on both lower lids of a child three years old during a severe attack of whooping cough. The extravasation disappeared from one eye, but in the other it increased and became a rapidly growing tumor, which displaced the globe. The discoloration diminished up to the time of the operation, which brought to light an encapsuled tumor. Its anterior portion consisted of a hollow space filled with blood, its posterior of a lipoma permeated with little cavities. Microscopically the septa showed infiltration with small cells. Laspeyres considers the tumor congenital and rare.

VON MICHEL (509, **Adenoma of the lid and a rare form of adenoma, the hydroadenoma papillare cysticum**) examined two cases of adenoma of the so-called modified sweat glands of Moll, which were taken from the lower lids of two old women, where they had slowly grown in the course of years to the size of half a cherry. The consistency was fairly solid. The clinical diagnosis was in one case that of cystadenoma or cystosarcoma of the skin or of the sweat glands, in the other that of epithelioma. Microscopically both adenomata presented the characteristics of hydropic degeneration of the connective-tissue portions of the tumor so that it was replaced in part by cysts. Hence he gives the name cystadenoma papillare hydropicum, or hydroadenoma papillare cysticum.

IX.—LACHRYMAL APPARATUS.

510. GILBERT, W. **The pathogenesis and histology of dacryops.** *Arch. für Augenheilkunde*, lv., 1 and 2, p. 13.

511. PFEIFFER. **Roentgen-ray therapy of the symmetric disease of the lachrymal and salivary glands.** *Beitraege zur klin. Chirurg.*, B. l., H. 1.

512. MEYER, ARTH. **Nasal treatment of epiphora.** *Berliner klin. Wochenschrift*, 1906, No. 23.

513. ENGELEN. **Monolateral lachrymation only when eating, following facial paralysis.** *Deutsche med. Wochenschrift*, 1906, No. 35, p. 1437.

514. PESCHEL. **The galvano-caustic probe for the lachrymal canal.** *Deutsche med. Wochenschrift*, 1906, No. 12, p. 465.

515. SULZER and DUCLOS. **Double lymphoma of the lachrymal sac following generalized lymphadenoma without leucæmia.** *Société d'ophtalmol. de Paris*, June 12, 1906.

In the man described by GILBERT (510, **The pathogenesis and histology of dacryops**) the entire conjunctival sac was destroyed by, and the mouths of the ducts of the lachrymal gland were closed by, molten lead. After about ten weeks a fistula appeared near the outer canthus from which clear fluid could be pressed every three or four days (dacryops fistulosus). Eight years later a purulent dacryoadenitis developed as the result of a febrile disease, the secretion accumulated until it formed a tumor as large as an apple in the upper lid, and extirpation was finally performed. The cyst lay between the muscularis and submucosa of the upper lid, from which it could not be separated, contained a clear fluid, and exhibited in its anterior wall a double layer of epithelium and some inflammatory foci of infiltration, doubtless due to the purulent dacryoadenitis. It could not be determined whether it was a dilated efferent duct or composed of the elements of the lachrymal gland. At any rate this traumatic dacryops was a true retention cyst and the gland had not atrophied.

PFEIFFER (511, **Roentgen-ray therapy of the symmetric disease of the lachrymal and salivary glands**) recommends careful X-ray treatment of this disease.

A slight swelling of the mucous membrane of the lachrymal canal may be caused by a peculiar bend of the inferior turbinate. MEYER (512, **Nasal treatment of epiphora**) recommends to break the turbinate with forceps. The operation is slight and frequently has produced good results.

In ENGELEN'S (513, **Monolateral lachrymation only when eating, following facial paralysis**) case conditions of irritation appeared after recovery without treatment from facial paralysis, although there was lessened reaction to the electric current. Engelen, therefore, assumes that there was a condition of irritation in the nucleus of the facialis upon which the lachrymal secretion depended. Treatment of the lachrymal sac was

of no avail therapeutically, but moist, warm compresses gave comfort and improvement.

PESCHEL (514, **The galvano-caustic probe for the lachrymal canal**) uses his probe in daily sittings, heated for a second ten or fifteen times and applied each time to a different place in the lachrymal sac. He thus obtains in chronic cases a rapid diminution of the purulent secretion and often the permeability of the canal also.

SULZER and DUCLOS (515, **Double lymphoma of the lachrymal sac following generalized lymphadenoma without leucæmia**) report a case of bilateral lymphoma of the lachrymal sac from a general lymphadenoma. An examination for tubercle bacilli proved negative. The author points out that in the observations hitherto published regarding lymphadenoma of the lids a long-persistent obstinate epiphora usually appeared as an initial symptom. He therefore thinks it possible that lymphadenomata of the lids usually start in the lachrymal sac. BERGER.

X.—ORBITS AND ACCESSORY SINUSES.

516. HIRSCHBERG, J. **A rare injury of the orbit.** *Centralbl. fuer prakt. Augenheilkunde*, xxx., p. 107.

517. DE LAPERSONNE and METTEY. **Cylindroma of the orbit.** *Société d'ophtalm. de Paris*, March 6, 1906, and *Archives d'ophtalm.*, xxvi., p. 193.

518. OPPENHEIMER, E. H. **The value of radiography in tumors of the orbit.** *Klin. Monatsbl. f. Augenheilkunde*, xliv., 1, p. 358.

519. MELLER, J. **The involvement of the orbit and of the eye in lymphomatous disease.** *Zeitschrift f. Augenheilkunde*, xv., 6, p. 538.

520. SEELIGSOHN, W. **A case of pseudo-leucæmic tumors of the orbit.** *Centralblatt f. prakt. Augenheilkunde*, xxx., p. 161.

521. SCHMIDT-RIMPLER. **Intermittent exophthalmos due to the formation of an angiocavernoma.** *Muench. med. Wochenschr.*, 1906, No. 27.

522. ROCHON-DUVIGNAUD and ONFRAY, R. **Chronic double exophthalmos due to a tubercular sclerosis of the intraorbital muscles.** *Archives d'ophtalmol.*, xxvi., p. 129.

523. STEGMANN, R. **The X-ray treatment of exophthalmic goitre.** *Wiener klin. Wochenschrift*, 1906, No. 3.

524. GEVERS LEUVEN, J. M. A. **Treatment of exophthalmic goitre with antithyreoidin.** *Muench. med. Wochenschrift*, 1906, No. 32, p. 1571.

525. ARONHEIM. **A case of exophthalmic goitre without exophthalmos treated with the antithyreoidin of Moebius.** *Ibid.*, p. 1570.

526. GUTMAN, ADOLF. **Diseases of the eye and empyema of the accessory sinuses.** *Zeitschrift f. Augenheilkunde*, xv., 5, p. 403.

527. SCHMIEGELOW, E. **Relations between diseases of the nose and of the eye.** *Arch. f. Laryngol.*, xviii., 3.

HIRSCHBERG (516, **A rare injury of the orbit**) drew out by means of the magnet from deep in the orbit a large piece of iron which had passed through the upper lid and had grazed the eyeball. The globe had been pushed forward by a large hemorrhage in the orbit; the pupil and accommodation were paralyzed. These recovered, as did also the affected internal and external recti and the visual field corresponding to the place where the eyeball was grazed, which presented a rupture of the choroid. The optic nerve, which had been slightly hazy, became somewhat pale on the temporal side and a scotoma was present near the centre of the field of vision.

DE LAPERSONNE and METTEY (517, **Cylindroma of the orbit**) describe a case of cylindroma of the orbit met with in a man twenty-eight years old. Four years previously a tumor had been removed from the outer canthus. It recurred at the end of fifteen months as an orbital tumor which seemed to originate in the region of the lachrymal gland, grew slowly, and displaced the eyeball outward and downward. The eye itself was not involved. The vision was 0.7. Exenteration of the orbit was performed with removal of the periosteum.

BERGER.

OPPENHEIMER'S (518, **The value of radiography in tumors of the orbit**) patient had an exophthalmos which had been slowly increasing for years and had been diagnosed as due to a benign tumor behind the eyeball. The X-rays revealed masses of tumor in the frontal sinus and ethmoid. These cavities also contained empyemata. Transillumination of the frontal sinus gave a negative result.

MELLER (519, **The involvement of the orbit and of the eye in lymphomatous disease**) reports an already partially reported case of bilateral lymphomatous tumors of the orbit in a child. Although arsenic had been of no avail, a sudden attack of fever and rapid decline of the child caused a rapid decrease of the orbital tumors. The child was then placed in the hospital by its parents. Meller repeats his idea that the tissue proliferations which take place in the orbit during the course of lymph-

omatous processes are not heteroplastic, but spring from the adenoid layer of the conjunctiva or the lymphadenoid tissue of the lymphatic gland. The diffusely infiltrating proliferations which arise here, after the manner of the lymphosarcoma, are not of a process which differs from leucæmia, while on the contrary an infiltration of the choroid is a heterotopic proliferation.

SEELIGSOHN (520, **A case of pseudo-leucæmic tumors of the orbit**) describes the following case: A feeble woman twenty-one years of age, after a moderately severe angina, was seized suddenly with loss of appetite, fever, accleration of the pulse, general debility, followed by rheumatic pains in the muscles, swellings of the joints, and acute nephritis. Choked disk appeared in both eyes associated with severe headache, and this was followed by cyclitis and exophthalmos. At the end of the seventh week tumors were noticeable in the orbits, and later there was a transient swelling of the liver. From the great exophthalmos it is probable that the tumors filled the orbit. It is supposed that the optic nerve was pressed upon so as to cause the choked disk. On the other hand, it is not excluded that this appertained to the picture of leucæmia or pseudoleucæmia, and the little collections of lymph in the retina which were observed for a short time may perhaps favor this view. Seeligsohn interprets the case as one of originally septic infection from the tonsils, the diseases in various parts of the body and the cyclitis having been called forth by toxins. These symptoms retrograded gradually, while the persistent choked disk and the tumors were to be ascribed to the pseudoleucæmia which had now become established in the greatly weakened patient. Improvement was obtained by means of arsenic, and vision returned, although the tumors in the orbit and the swelling of the nerves remained. Seeligsohn considers the diagnosis—pseudoleucæmia—provisional, as he thinks that leucæmia may develop from the condition.

SCHMIDT-RIMPLER'S (521, **Intermittent exophthalmos due to the formation of an angiocavernoma**) eighteen-years-old patient had congenital cavernomata in the mucous membrane of the left side of the mouth, in the conjunctiva of the left eye, and in the left orbit. Hemorrhages occurred in the former at times. The one in the orbit had displaced the globe lat-

erally and became swollen through stasis or congestion so that it produced a marked exophthalmos. Ophthalmoscopically no changes were visible, but the vision was very bad.

ROCHON-DUVIGNAUD and ONFRAY (522, **Chronic double exophthalmos due to a tubercular sclerosis of the intraorbital muscles**) observed in a man sixty-two years old the onset of a bilateral exophthalmos with contraction of the visual field. A tarsorrhaphy was performed on account of keratitis. The patient died from a mitral insufficiency. At the autopsy a great increase in the volume of the eye muscles was shown to be the cause of the exophthalmos. The increase in volume was due to a sclerosis and cirrhosis of tubercular nature, but the autopsy revealed no other sign of tuberculosis. BERGER.

According to STEGMANN (523, **The X-ray treatment of exophthalmic goitre**), exophthalmic goitre may be cured by exposure of the affected thyroid gland to the X-rays.

GEVERS LEUVEN (524, **Treatment of exophthalmic goitre with antithyreoidin**) obtained a good result from antithyreoidin only after the discontinuance of the serum, but at any rate no injurious after-effects were produced.

ARONHEIM (525, **A case of exophthalmic goitre without exophthalmos treated with the antithyreoidin of Moebius**) saw a real improvement of all the symptoms after the second dose of antithyreoidin.

GUTMANN (526, **Diseases of the eye and empyema of the accessory sinuses**) claims the rupture of an empyema of the frontal sinus into the orbit and the production of a phlegmon is characterized by a doughy, inflammatory infiltration, sometimes by a marked phlegmon, of the upper lid with a rounded swelling which marks the place of the abscess formation just above the inner canthus or a little nearer the supraorbital notch. The eyeball is displaced downward and outward. Empyema of the ethmoid breaks through the lamina papyracea and causes an infiltration about the inner canthus equally affecting both lids, and the eyeball is usually displaced toward the temporal side. Empyema of the sphenoid sinus threatens the optic nerve. According to Gutmann, the ophthalmoscopic picture of neuritis or perineuritis of the optic nerve together

with the exophthalmos suffices for the recognition of a rupture of an empyema of the sphenoidal sinus into the orbit. Iritis and choroiditis have been caused repeatedly by empyema of the antrum of Highmore, which is often associated with disease of other sinuses. Thrombosis of the central vein of the retina may originate from propagation of thrombosis of the small veins of the orbit to the eye.

SCHMIEGELOW'S (527, **Relations between diseases of the nose and of the eye**) observations should cause the ophthalmologist to remember that the diagnosis of many diseases of the accessory sinuses is difficult, but often of great value in the treatment of eye diseases, as he shows in a case of retrobulbar, and another of double, neuritis.

XI.—CONJUNCTIVA.

528. KASASS, E. J. **Saemisch's disease (vernal catarrh).** *Medic. Oboscen.*, 1906, No. 6.

529. HOOR, K. **Parinaud's conjunctivitis.** *Klin. Monatsbl. f. Augen.*, xliv., 1, p. 289.

530. BERNHEIMER, ST. **Parinaud's conjunctivitis.** *Ibid.*, p. 323.

531. HOCHEISEN. **Gonococcæmia in an infant with blennorrhœa.** *Arch. f. Gynæcol.*, B. 79, 2.

532. WODRIG. **A case of arthritis after ophthalmoblennorrhœa, with especial reference to the historical development of the teaching in regard to gonorrhœal diseases.** *Inaug. Dissert.*, Berlin, 1906.

533. GREEFF, R. **Trachoma as a military disease.** *v. Leuthold Gedenkschrift*, vii.

534. v. BLASKOVICS, L. **Excisions of the conjunctiva and tarsus in trachoma.** *Zeitschr. f. Augenheilkunde*, xv., 5, p. 391.

535. HESS, C., and ROEMER, P. **Experiments in the transplantation of trachoma to monkeys.** *Arch. f. Augenheilkunde*, lv., 1 and 2, p. 1.

536. GOLDZIEHER, W., and GOLDZIEHER, M. **Pathological anatomy of trachoma.** *Archiv f. Ophthalmol.*, lxiii., 2, p. 287.

537. JACOBY, E. **Treatment of trachoma with radium.** *Deutsche med. Wochenschrift*, 1906, No. 2, p. 61.

538. ZELENKOWSKY. **The use of radium in diseases of the eye Treatment of trachoma (in the granular stage).** *Russky Wratsch*, 1906, No. 9.

539. AUERBACH, M. **Primary tuberculosis of the conjunctiva.** *Westn. Oph.*, 1906, No. 3.

540. ISCHREYT. **Hyaline degeneration of the conjunctiva.** *Archiv f. Augenheilkunde*, liv., 4, p. 400.

541. COSMATTATOS, G. F. **Epibulbar epithelioma.** *Archives d'ophtalm.*, xxvii., p. 448.

542. MATHIEU. **Tumors of the limbus.** *Archiv f. Augenheilk.*, lv., 3, 223.

543. BAQUIS, ELIA. **Congenital tumor-like, glandular malformations of the anterior segment of the eyeball.** *Arch. f. Ophth.*, lxiv., 1, p. 187.

544. SCHAPRINGER, A. **The epitarsus.** *Centrlbl. f. prakt. Augenheil.*, xxx., p. 146.

KASASS (528, **Saemisch's disease**) describes five cases of vernal catarrh, two in children, three in adults. In two the disease reached its acme not in summer but in winter. The name catarrh he considers unsuitable, because catarrhal symptoms are absent in uncomplicated cases. HIRSCHMANN.

HOOR (529, **Parinaud's conjunctivitis**) reports a case in which all of the symptoms of Parinaud's conjunctivitis were present. The patient was a cow-herd who had an attack of fever associated with swellings of the glands and lids and on the conjunctiva both very large and small granulations, wart-like excrescences, and yellow foci of infiltration with necrosis. There was a moderate amount of mucous discharge mixed with pus. The cornea and the other eye remained unaffected. Treatment was mild, recovery complete after some weeks. No result was obtained from inoculations on animals.

BERNHEIMER'S (530, **Parinaud's conjuncitvitis**) case was very severe. The secretion of mucus and pus was controlled after some weeks by caustic treatment, but little marginal ulcers of the cornea were formed, which is unusual, and the proliferations of the conjunctiva, which were in part fleshy, broad, and varying in size from that of a pinhead to that of a lentil, in part pedicled and presenting yellow points, increased in spite of removal and cauterization. In addition to the local troubles there was a fluctuating fever, until at the end, of three months he excised the proliferating conjunctiva with the tarsus of the upper lid. Healing took place smoothly with no limitations of movement. The disease was found microscopically to be confined to the adenoid tissue as in other observations. The tarsus was unchanged.

HOCHEISEN (531, **Gonococcæmia in an infant with blennorrhœa**) found gonococci not only in the conjunctival discharge, but also in the pus from a tendon sheath and on the trochanter.

WODRIG'S (532, **A case of arthritis after ophthalmoblen-**

norrhœa, with especial reference to the historical development of the teaching in regard to gonnorrhœal disease) case was that of a man twenty years old, who, without suffering from a urethritis, had his left eye infected with gonorrhœa by means of a towel. The cornea was perforated at the end of a week; five days later there was an inflammation of the wrist-joint, which extended to the fingers and passed away at the end of ten weeks. The ophthalmia was cured at the end of a month. In his interesting presentation of the history of the theory of gonnorhœal diseases the author deals particularly with the modern views in regard to the occurrence of metastatic complications. These may occur either as pure metastases of gonococci, by way of the blood or lymph passages, or as mixed or secondary infections in which gonococci are often found together with pus cocci. Complications arise entirely without gonococci through toxins.

GREEFF (533, **Trachoma as a military disease**) considers the military rules in regard to trachoma faulty because no reference is made to the harmless follicular catarrh.

VON BLASKOVICZ (534, **Excisions of the conjunctiva and tarsus in trachoma**) performs this operation in 55% of his cases. Usually it clears up pannus. The results are less favorable in the retrogression of the conjunctival infiltration; a more favorable influence shows itself in relapsing trachoma. The operation is of little use in cases with great engorgement of blood and hypertrophy of the conjunctiva with mucopurulent secretion. The most incontestable value of the excision of the tarsus the author finds in its action against trichiasis and in the correction of trachomatous ptosis. In 10% of the cases the upper lid appears some weeks after the operation to be drawn strongly upward without interference with the closure of the lids. This is not influenced by the breadth of the excision from the conjunctiva or the tarsus or the position of the sutures. But von Blaskovicz found bands of muscle on the tarsus which had been advanced and the division of these corrected the fault. The wound needs to be closed with sutures, as otherwise large granulations develop. After the operation there is a slight recurrence of pannus. No limitations of movements were met with.

HESS and ROEMER (535, **Experiments in the transplantation**

of trachoma to monkeys) inoculated fresh human trachomatous material into the conjunctiva of baboons and produced very large granulations, with a proportionately great infiltration of the neighboring adenoid tissue. A re-inoculation to a second monkey's eye was successful in so far as granules not apparent clinically were found microscopically in the conjunctiva. Inoculation material twenty-four hours old was useless. They also found the filtrate from an excised trachomatous fornix, which had been passed through a filter, to be sterile, but the remains in the filter produced new granulations on the conjunctiva. The incubation lasted three or four weeks. The disease appeared to be milder in the monkeys than in the men from whom the material was taken. The bacteriological examination gave a negative result; the bacillus of L. Mueller could not be found.

W. and M. GOLDZIEHER (536, **Pathological anatomy of trachoma**) elucidate the nature of the conjunctiva, which in the new-born infant is smooth, but plentifully supplied with papillæ that contain many arteries and few veins and supply the mucous membrane with a watery fluid. The epithelium, which is smooth in the new-born, covers these papillæ of the conjunctiva and forms, with elevations and depressions, a system of sulci. The round-cell infiltration, the so-called adenoid layer, appertains as an accident to the vascular construction formed as papillæ, is absent in the new-born, and develops later to a varying degree, even in healthy conjunctivæ. Hence one should speak only of a vascular layer of the conjunctiva rather than of an adenoid layer. In trachoma the disease starts here through an unknown specific cause. The adventitial cell elements develop freely lymphocyte cells into inflammatory granulomata, the trachoma granules, beneath the epithelium and in the tarsus. Among the cells of the granule Goldzieher mentions the autophagus described in another place. After the specific irritation has become exhausted there is a destruction of the perivascular proliferation, and parallel with it a new formation of connective tissue from the fibroblasts of the vessel walls, which is synchronous with the termination of the trachomatous process. Goldzieher obtained his material for his investigations wholly from untreated cases for whom the slight operation served not only to

cure but to relieve the pain. In some remarks in regard to morphologically and clinically related conditions Goldzieher states that the great thickening of the conjunctiva in senile catarrh, which causes ectropium, depends also on the proliferation of the vascular layer, while the proliferation of epithelium follows secondarily. He also holds the most marked and most characteristic condition of acute gonorrhœal ophthalmia to be the colossal distension and filling of the subepithelial vascular papillæ.

Jacoby (537, **Treatment of trachoma with radium**) has used the radium treatment according to Cohn's method in nine cases of trachoma and three of follicular conjunctivitis. He finds that radium seems to exert a certain influence over trachoma. It is not yet proven how far this is promoted by such other factors of treatment as massage and hyperæmia. The results of the radium treatment are inferior in certainty and time to those of the mechanical, medical treatment. In general time is lost in the use of radium.

Zelenkowsky (538, **The use of radium in the diseases of the eye**) concludes: (1) The radium rays exert a destructive (cytolytic) action upon cell elements of all types. The elastic, muscular, and cellular tissues take part in the reaction only secondarily. (2) The effect is most pronounced in the period of growth of the organism. (3) The effect is particularly well marked on the cells of the pathological tissue during the period of its growth. (4) Upon the sound skin the effect is weaker and takes place only after a prolonged exposure on the cells of the covering layer of epithelium. (5) The mucous membranes and the peritoneum are particularly resistant to their action. (6) The cytolytic action of the rays is very intense on the cells of lymphatic formations. (7) The nature of the action of the rays upon the cells is either change (decomposition) of the chromatin of the nucleus, or the decomposition of a true constituent of the cell, the lecithin, which interferes with the nutrition of the cell and brings about its destruction. (8) The radium rays exert a bactericidal action independently of the medium in which the bacteria are present. (9) They affect very slightly or not at all toxins, ferments, and enzymes, but exert a destructive action on the blood. In Chapter 7 the author gives a compilation of the literature on the action of

the radium rays upon the normal eye, from which it is to be seen that the eye is injuriously affected only by the use of large quantities of radium and prolonged exposure. Systematic investigations, either clinical or histological, with small quantities and short exposures have not yet been published. In Chapter 8 he refers to the attempt to treat diseases of the eye with radium rays. Thorough systematic works on this subject are wanting. In particular the statements concerning the treatment of trachoma are contradictory: some authors obtain positive results, others negative. The second section of this work contains the attempts of the author to determine on the eyes of rabbits and on his own eyes the quantities of radium and the duration of the exposure which will not harm the eye, and he formulates his results in the following manner: (1) The reaction of the eyeball to the Becquerel rays is proportional in a certain degree to the quantity of radium and the duration of the exposure. (2) The cornea is a sensitive clinical guide to the injurious effect of the rays on the eye. (3) The degenerative changes which take place under certain conditions cannot always be ophthalmoscopically demonstrated. (4) These changes in the retina appear after long-continued and often-repeated exposures of the eyeball to large quantities of radium. (5) The effect of radium upon the eye is cumulative. (6) The reaction of the eye to the effect of radium takes place after a certain latent period, which is about two weeks for the eye of a rabbit. (7) Repeated direct exposures of the cornea for ten minutes to the rays from 10*mg* of bromradium do no harm to the eyes of rabbits, and are still less dangerous to the eye when directed upon the mucous membrane of the lids. (8) The like exposure of the mucous membrane of the everted lid is also harmless to the human eye. (9) The possibility of causing changes in the retina or other parts of the eye even with smaller quantities of radium and briefer exposures forbids the direct application of the rays to the eye. In the third section the author gives the clinical histories of twenty-five cases of trachoma treated by him with radium rays. A perfect cure was attained in all in a comparatively short time, and he summarizes his results thus: (1) Exposure of the conjunctiva of the everted lids to at the most 10*mg* of bromradium for a maximum period of ten minutes for each lid,

repeated every second or third day, affords no danger either to the eye or to the conjunctiva. (2) Radium is a very active remedy for trachoma in the granular stage in the absence of catarrhal symptoms. The granules disappear without leaving scars or other pathological signs. (3) The rays are also probably of use in cicatricial trachoma, against the remaining granules and infiltration. (4) In the latter form of trachoma the use of radium is preferable to the other forms of treatment. (5) When the granules are very extensive, ten-minute exposures of the entire mucous membrane are the most efficient; in milder cases five-minute exposures are sufficient. (6) The results of the treatment are first visible after from two to four exposures, four to eight days. (7) On account of the cumulative action of the radium the exposures should not be given daily, but every two or three days. (8) After the granules have all disappeared, the exposures should be continued once or twice, and if then a noticeable swelling of the mucous membrane should remain, treatment with astringents should be adopted. (9) To obtain the best results the preparation of radium which is used must have a considerable radioactivity; therefore, the preparation should be tested before it is used. (10) Direct exposure of the eyeball is not permissible.

HIRSCHMANN.

AUERBACH (539, **Primary tuberculosis of the conjunctiva**) gives the clinical histories of two cases of primary tuberculosis of the conjunctiva. The first patient was a girl ten years old. The lids of both eyes were swollen with a muco-purulent secretion. On the inner surface of both lower lids were ulcers with undermined edges, uneven fatty bases, and pale granulations, from which here and there sprang gray nodules. The preauricular glands were swollen. There was an ulcer in the anterior part of the left nostril. The disease had started one and a half to two years before, after a blow on the right eye, the ulcer in which was considerably the larger. The second patient was a girl one year old. On the conjunctiva of the right lower lid there was an ulcer involving the tarsal cartilage exactly similar to those in the preceding case. The preauricular gland was slightly swollen. In both cases all the organs were sound and there was no hereditary predisposition. In both cases the microscope showed the characteristic picture

of tuberculosis and in the first case Koch's bacillus also. The injection of an emulsion of the tissue of the floor of the ulcer into the abdominal cavity of a guinea-pig caused tuberculosis in both cases. In both cases perfect recovery was obtained by scraping, galvano-cauterisation, airol, and phenosalyl. The author gives an analysis of the literature on the subject of tuberculosis of the conjunctiva. HIRSCHMANN.

ISCHREYT (540, **Hyaline degeneration of the conjunctiva**) says that the clinical picture of hyaline degeneration of the conjunctiva is so little characteristic that it is frequently mistaken for follicular trachoma, lymphoma, leucosarcoma, or syphilitic tarsitis. The positive diagnosis, particularly its differentiation from amyloid, can be made only by the microscopical examination. He examined two cases, one in a child with trachoma who had a tumor of the form and position of the enlarged tarsus of the lower lid, the other in an adult who presented amyloid-like proliferations of all four lids which had involved the caruncle, plica, and ocular conjunctiva. Nothing certain could be ascertained as regards the etiology. Trachoma is certainly not the true cause. Ischreyt groups the reported cases into types according to their pathological conditions. First type: conjunctival colloid, in which there appear in the cells of the adenoid tissue little granules of hyalin, which come to lie in the meshes of connective tissue after the destruction of the cells. Second, most frequent type: extensive hyaline degeneration arises in the vessel walls, especially of the arteries, in the submucosa, which involves the surface and the mucosa secondarily. Third type: great development of a granulation tissue in place of the mucosa, on account of which the hyaline degeneration retrogrades and does not result in the formation of connected layers as in the second type. The hyaline degeneration starts extracellularly in the connective-tissue bundles and fibres. In the fourth type, layers of conjunctival colloid are formed with a proliferated adenoid tissue; the vessels appear scarce and broad homogeneous rings occupy the place of the adventitia. A classification according to color reaction is at present impossible.

COSMETTATOS (541, **Epibulbar epithelioma**) describes a case of epibulbar papillary epithelioma met with in a woman forty-five years of age. It started in the temporal corneo-scleral

margin, extended into the conjunctiva of the globe, and involved Bowman's membrane and the superficial layers of the cornea. The author points out as the peculiarity of this case that the neoplasm tended to penetrate into the eye through the cornea and not through the corneo-scleral limbus.

BERGER.

MATHIEU (542, **Tumors of the limbus**) examined three tumors taken from the conjunctiva and cornea. Two were neoplasms related to the benign papillomata of the conjunctiva, although they consisted chiefly of masses of epithelium separated from the not-distinctly-changed connective-tissue matrix by a sharp, slightly undulating line. The third tumor resembled clinically a non-pigmented nævus and a benign, cystic epithelioma, or dermo-epithelioma; histologically it proved to be localized malformation of a circumscribed portion of the conjunctiva with scattered, proliferating epithelial germs.

BAQUIS (543, **Congenital tumor-like glandular malformations of the anterior segment of the eyeball**) examined a tumor met with in an infant, which extended from the outer canthus to the cornea and from the upper to the lower retrotarsal fold, and formed a flat, tuberculated protrusion beneath the ocular conjunctiva. It was freely movable on the eyeball and covered the cornea partially with a tendinous white membrane. As the tumor had increased in size at the end of six months, Baquis removed it and found in it aggregations of acinotubular glands of Krause's type, with numerous excretory ducts which opened on the surface of the ocular conjunctiva. Between the glandular lobules lay fat, vessels, nerves, and cartilage. In all parts of the formation Baquis found signs of an inflammatory process the beginning of which he placed in the first fœtal month. As similar malformations have been seen he recognizes therein a certain type.

SCHAPRINGER (544, **The epitarsus**) considers a condition, described recently by Robertson as a third lid, to have been epitarsus.

XII.—CORNEA, SCLERA, ANTERIOR CHAMBER.

545. KEIPER, G. F. **Bacteriology of a case of dendritic keratitis.** *Amer. Jour. of Ophthalmology*, June, 1906.

546. FRANKE, E. **Diseases of the corneal epithelium.** *Klin. Monatsbl. f. Augenheilkunde*, xliv., 1, p. 508.

547. SCHUSTER, P. **Casuistics of crystal-like formations of the eye. 1. Glandular formation in an adherent leucoma.** *Arch. f. Augenh.*, liv., 4, 363.

548. BECK, A. **Casuistics of crystal-like formations of the cornea.** *Archiv f. Augenheilkunde*, lv., 3, p. 285.

549. FREUND, H. **Reticulated keratitis.** *Wiener klin. Wochenschr.*, 1906, No. 5, p. 123.

550. WEHRLI, E. **Further clinical and histological studies of chronic lupus of the cornea, presenting the appearance of nodular opacity of the cornea.** *Archiv f. Augenheilkunde*, lv., 1 and 2, p. 126.

551. SEEFELDER. **Contributions to the study of foetal inflammations of the eye. (Anatomical examination of a case of fresh keratitis in an eight-months fœtus, and of a case of fresh keratitis in a seven-months fœtus.)** *Arch. f. Ophthalmologie*, lxiv., 1, p. 224.

552. RABIGER, H. **Etiology of parenchymatous keratitis.** *Inaug. Diss.*, Berlin, 1906.

553. PICK. **Some ophthalmological observations. 1. Treatment of corneal opacities.** *Centralbl. f. prakt. Augenheilkunde*, xxx., p. 176.

554. VOSSIUS, A. **Treatment of ulcus serpens corneæ, with special reference to the pneumococcus serum.** *Med. Wochenschr.*, vii., 1906, No. 6.

555. KUHNT, H. **Treatment of fresh, complicated, penetrating wounds of the cornea.** *Zeitschrift f. Augenheilkunde*, xv., 4, p. 312.

556. WESTHOFF, C. H. A. **Pterygium operation.** *Medisch. Weekblad*, xiii., No. 7.

557. HERBST. **A striking anomaly of development of the eye (cord-like union between the cornea and the pigment layer of the iris).** *Klin. Monatsbl. f. Augenheilkunde*, xliv., 1, p. 474.

558. KRAEMER, A. (San Diego). **A new contribution to congenital pigmentation of the cornea.** *Centralbl. f. prakt. Augenheilk.*, xxx., p. 135.

559. WAGENMANN, A. **Posterior scleritis.** *Arch. f. Ophth.*, lxiv., 2, p. 380.

KEIPER (545, **Bacteriology of dendritic keratitis**) gives a description of what appears to be a new form of micro-organism obtained from a dendritic ulcer. It is a short, thick diplobacillus with a tendency to arrangement in pairs. Motility absent. Stains well with anilin. Gram negative. Growth on agar, small spherical colonies of bluish tinge. Do not liquefy gelatine. Blood serum, grayish-white growth. On potato, growth slight and invisible. Bouillon, scant. Guinea-pigs suffer no ill effects. ALLING.

FRANKE (546, **Diseases of the corneal epithelium**) finds that

ten or twelve hours after superficial injuries of the cornea there is a loosening of the epithelium over a region as large often as a lentil, sometimes over the entire cornea. Smaller areas are found after injuries from foreign bodies such as emery powder or iron rust, more extensive with recurrent erosion, traumatic keratalgia, dendritic and herpetic keratitis, as after influenza and in the beginning of an ulcus serpens. The demonstration is made by stroking the cocainized cornea with a blunt instrument. Microscopically he finds in the detached epithelium inter- and intracellular œdema and changes of the nuclei; in inflammatory conditions Unna's balloon-like degeneration of the epithelium also. A very similar affection of the corneal epithelium may be produced experimentally in rabbits. Therapeutically the best treatment in recurrent erosion and traumatic keratalgia is thorough pencilling with chlorine water; hydrogen dioxide and dionin may also be used. This condition may last for years and first show itself very late.

In a leucoma which showed nothing special on an ordinary examination, SCHUSTER (547, **Casuistics of crystal-like formations of the eye**) saw, with the aid of Zeiss's loupe, crystals with a silky gloss throughout the parenchyma, as seen in asbestos. The mass offered much resistance to tattooing and then spread beyond its former boundaries.

BECK (548, **Casuistics of crystal-like formations of the cornea**) describes a case quite analogous to that of Schuster in which a white spot on the cornea presented the appearance of asbestos under the microscope. Six months before the eye had suffered from an attack of scleritis in which the cornea remained clear. Suddenly a little spot had appeared, which from an unknown cause covered several square millimetres within fourteen days and presented the appearance described.

FREUND (549, **Reticulated keratitis**) has investigated two families that have suffered from reticulated keratitis for three or four generations, and finds that in one family all the adults, and in the other almost all, suffered from this form of keratitis. The numerous children were free from it. At the age of puberty gray superficial spots appeared in and about the centre of the cornea, with a roughening of the epithelium. A bluish-gray opacity could be seen by means of the loupe to be due to

an irregular network of crossing lines. The margins of the cornea remained clear. In a part of the cases painful inflammations and ulcerations set in. No treatment, not even scraping and jequirity, proved of avail. He refuses the assumption of lupus corneæ as far as his cases are concerned.

WEHRLI (550, **Further clinical and histological studies of chronic lupus of the cornea**) finds in the removed corneal tissue of a case already described histological confirmation of the theory that the process is tuberculous even though all symptoms were not present and though the inoculation of rabbits proved negative. Tuberculin injection produced a general reaction as well as a local in the form of metamorphosis of the nodules into little ulcers. The virulence must be very slight. Treatment consists in thorough scraping and general therapy. Wehrli discusses from literature the negative histories of other authors, the infectiousness, heredity, and predisposition to tuberculosis of other diseases of the cornea in which absence of vascularization and of signs of irritation have likewise been described, and defends the name lupus as applied to his observations.

In his first case SEEFELDER (551, **Contributions to the study of fœtal inflammations of the eye**) diagnosed kerato-iritis from extensive changes of the epithelium of the cornea, very marked infiltration of the stroma with polynuclear leucocytes in places, proliferative processes in the corneal corpuscles, formations of precipitates on the posterior wall of the cornea, and a great emigration of leucocytes from the iris and pupillary membrane. In his second case he found, in addition to similar changes, a very marked perivascular infiltration of the vessels of the marginal network and of the corneo-scleral margin. The leucocytes in the cornea appeared in this case to be rather immigrated elements, while in the first case a local increase was more probable. The etiology was not determined. The author considers that a sort of interstitial keratitis in fœtal life and congenital corneal opacity without previous purulent inflammation of the corneal tissue is doubtless possible.

RABIGER (552, **Etiology of parenchymatous keratitis**) finds an unknown or only a probable etiology in 26% of 349 cases of parenchymatous keratitis observed at the University Policlinic at Berlin and examined by physicians connected with

other departments, such as internal medicine, ear, nose, and teeth. In no case was a traumatic origin found. Hereditary syphilis as shown by the association of one or more other symptoms of that disease was diagnosticated with certainty in 17%, with probability of 13%. Congenital syphilis was present in 3%. Tuberculosis—which, especially when situated in the ligamentum pectinatum, iris, and ciliary body, causes a secondary parenchymatous keratitis—was found with certainty in 11%, with probability in 9.7%. The overwhelming majority of the tuberculous were over twenty years of age, while perhaps two thirds of the entire number of patients were under that age. Scrofula alone was found in 4.3%, associated with rickets in 4.8%, rickets alone in 3%, chronic nephritis in 0.86%, anæmia and clorosis alone in 2.6%, very frequently as an accessory condition. Struma and arteriosclerosis appear very rarely as the only disease in association with parenchymatous keratitis.

Pick (553, **Treatment of corneal opacities**) obtained a marked clearing up of old opacities of the cornea by the use of the aqua ammonia recommended for the clearing of chalky opacities of the cornea, one to three teaspoonfuls in a glass of lukewarm boiled water, applied by means of compresses for twenty minutes three or four times a day. If the scars are old, the compresses must be kept up for some weeks.

Vossius (554, **Treatment of ulcus serpens corneæ, with special reference to the pneumococcus serum**) relies upon the old means of treatment of ulcus serpens corneæ. Roemer's serum can be used as a prophylactic whether pneumococci are demonstrated on the slides or not. The prophylactic extirpation of the lachrymal sac cannot be sustained in practice.

In fresh injuries of the cornea, iris, lens, and vitreous in which the lens shows a tendency to swell, Kuhnt (555, **Treatment of fresh, complicated, penetrating wounds of the cornea**) recommends performing a large iridectomy whenever there is prospect of preservation of the sight. The later the operation is performed the more difficult it is for the surgeon and for the eye. Kuhnt recommends the same procedure in the case of perforating ulcers in addition to a transplantation of conjunctiva.

In India the operation for pterygium is not rare. WESTHOFF (556, **Pterygium operation**) describes a modification of the operation in order to take away as little as possible of the conjunctiva. The fold of conjunctiva is freed with curved scissors 2 or 3*mm* from the apex of the pterygium. The pathologically degenerated fimbriated margin is then separated from the cornea by means of a curved knife and the surface of the wound thus produced scraped clean with a sharp spoon. A single suture suffices to close the conjunctival wound.

JITTA.

According to HERBST'S (557, **A striking anomaly of development of the eye**) description, the brownish-black cord about 1.5*mm* thick came from behind the iris and was not attached to its margin, which was freely movable. In the other eye there was a spot in the cornea opposite the cord which corresponded to its insertion in the first eye, but the cord hung freely in the anterior chamber. At the same time there were several eversions of the pigment layer at the pupillary margins of both eyes. Herbst can find no satisfactory explanation of the attachment of these cords to the cornea.

KRAEMER (558, **A new contribution to congenital pigmentation of the cornea**) observed a bilateral, deep, probably congenital, spindle-shaped brown pigmentation of the cornea. The pigmentation was delicate in the middle, most dense in the indented margin. Vision was undisturbed.

The diagnosis of posterior scleritis often presents difficulties, as shown by WAGENMANN (559, **Posterior scleritis**), because three different sets of symptoms exist at the same time, namely those due to the orbit, the retina, which is detached, and the iris, which is inflamed. The lids and conjunctiva are swollen, the eyeball exophthalmic and restricted in movement, the iritis not severe, the cornea has deposits on its posterior surface, and the media are otherwise clear. There is great pain and the vision is very bad. But the external symptoms improve, the retina becomes reattached, the vision improves very much, with a good field. At times there is myopia. Wagenmann believes the iritis to be secondary, due to the involvement of the neighboring tissues by the extension of the inflammation over the outer and inner surface of the sclera

from the deep scleritis. The comparatively rapid improvement under iodide of potassium leads one to think of a syphilitic etiology, but other reports of posterior scleritis also show a rapid improvement.

Sections XIII.–XVIII. Reviewed by Dr. NICOLAI, Berlin.

XIII.—LENS.

560. Leber, A. **Metabolism of the crystalline lens.** *Archiv f. Ophthalmologie*, lxiv., 1, p. 83.

561. Tonfesco, Mlle. **Preliminary note concerning the nature of degenerative changes of the crystalline fibres.** *Société d'ophtalmologie de Paris*, July 6, 1906.

562. Tonfesco, Mlle. **The pathological crystalline lens.** *Ann. d'oculistique*, cxxxvi., p. 2.

563. Sachs. **Peculiar thickening of the lens capsule in the region of colobomata of the iris.** *Centralbl. f. prakt. Augenheilk.*, xxx., p. 183.

564. Guzmann, E. **Two cases of cataract due to lightning stroke.** *Wiener klin. Wochenschrift*, 1906, 16.

565. Bartels, R. **A contribution to tetany cataract.** *Klin. Monatsb. f. Augenheilkunde*, xliv, 1, p. 374.

566. Pineles, F. **Tetany cataract. Diabetic cataract. Senile cataract.** *Wiener klin. Wochenschrift*, 1906, No. 23.

567. Vossius. **Circular opacities on the anterior surface of the lens after contusions of the eye.** *Arch. f. Augenheilkunde*, lv., Nos. 1 and 2.

568. Keller, A. **Circular opacities on the anterior surface of the lens after contusions of the eye.** *Inaug. Dissert.*, Giessen, 1906.

569. Chaillons and Polack. **Annular opacity of the lens following a contusion of the eyeball.** *Soc. d'ophtalm. de Paris*, March, 1906.

570. Wopfner. **A case of metastatic panophthalmitis in an eye which had been operated on for cataract in consequence of a croupous pneumonia with Friedlaender's pneumobacillus.** *Klin. Mon. f. Augenheilkunde*, xliv., 1, p. 386

571. de Lieto Vollaro. **Studies concerning the bacteria of the conjunctiva in the postoperative treatment of cataract without occlusion bandage.** *Arch. di Ottalm.*, xii.

572. van Duyse. **Cyanopsia and xantopsia of lenticular origin in the same subject.** *Arch. d'ophtalm.*, xxvi., 7, p. 417.

573. Possek, R. **Spontaneous reposition of a lens subluxated by traumatism.** *Klin. Monatsbl. f. Augenheilkunde*, xliv., 1, p. 381.

Leber (560, **Metabolism of the crystalline lens**) has tested the behavior of the lens to diffusible substances, a matter of

considerable import in the nutrition of the lens by diffusion. The tests included inorganic and organic substances and coloring matters. Fluorescin penetrates slowly and with difficulty. In old age the lens is richer in fat and allied substances.

MLLE. TONFESCO (561, **Preliminary note concerning the nature of degenerative changes of the crystalline fibres**) describes the senile changes in the lens fibres, which consist of a fatty degeneration. Later a more homogeneous mass with formation of vacuoles is found.

MLLE. TONFESCO (562, **The pathological crystalline lens**) concludes from an anatomical study of different forms of cataract that all forms of cataract begin in the equator of the lens, though a cytologic change hitherto unknown of the central lenticular fibres seems to lie at the bottom of cataract formation. She finds the same degenerative processes of the lenticular fibres, principally fatty degeneration, in all forms of cataract except the black. She uses for this demonstration Unna's method of staining with osmic acid as modified by Mulon.

BERGER.

SACHS (563, **Peculiar thickening of the lens capsule in the region of colobomata of the iris**) performed an iridectomy for hydrophthalmos in a child two months old with a good result. In each eye he afterward found a thickening of the lens capsule situated in the coloboma of the iris at the equator of the lens. It was dependent on cicatrization of delicate lacerations of the capsule in the field of the iridectomy.

GUZMANN (564, **Two cases of cataract due to lightning stroke**) reports two cases in which bilateral cataract resulted from a stroke of lightning. At the operation on one of the patients gray pulpy masses escaped immediately after the incision had been made. As the capsule had not been injured by the keratome it must have been lacerated by the lightning stroke.

BARTELS (565, **A contribution to tetany cataract**) has described eight cases of tetany cataract which he has met with in five years among 820 cataract extractions. As exciting causes, changes of the weather and gastro-intestinal troubles are mentioned, as well as combinations of tetany, myotony, and muscular atrophy. Theories differ greatly in regard to the connection between tetany and cataract. Peters's theory that the ciliary epithelium is changed by a toxic influence and that

the increased proportion of albumin and salt in the aqueous brings about an opacity of the lens, is combated by Leber. The anatomical findings in this case indicate a trophic disturbance of the entire lens.

PINELES (566, **Tetany cataract. Diabetic cataract. Senile cataract**) has found by physiological experiments that poison forms the basis of all forms of human tetany which comes into action in tetany due to the removal of the thyroid gland in consequence of the abolition of the function of the epithelial corpuscles. Not only nervous, but trophic disturbances as well, falling of the hair, and of the nails, and cataract, occur in all forms of human tetany. The frequency of tetany cataract shows that the cataract takes its origin in the deficiency of function of the epithelial corpuscles. The epithelial corpuscles belong among the so-called blood glands, such as the thyroid gland and the suprarenal capsules. It is not surprising that cataract appears in diabetes, which is related to the blood glands, and the same is true of senile cataract, which appears in diseases which are related to the blood glands. In regard to the genesis of senile cataract this is in agreement with the modern theory that general rather than local causes are to be sought for the formation of cataract.

VOSSIUS (567, **Circular opacities on the anterior surface of the lens after contusions of the eye**) describes the peculiar circle on the opaque lens after contusion, which resembled an impression of the pupillary margin about *3mm* broad. The circle is often brownish, sometimes visible only with the loupe, and seems to consist of a series of points. After four weeks the symptom disappears, the vision remains normal. Hemorrhage into the anterior chamber, laceration of the sphincter, and rupture of the choroid, with hemorrhage into the vitreous, have been observed. It is dependent either on pigment pressed out of the pupillary margin, or on a transient degenerative change of the epithelium of the capsule.

KELLER (568, **Circular opacities on the anterior surface of the lens after contusions of the eye**) reports six cases in which there was a circular opacity on the anterior surface of the lens after traumatism. Usually it first becomes visible after resorption of the hyphæma. He considers it beyond doubt an impression of the margin of the pupil. If the circle is of a brown-

ish color it must be assumed that pigment cells were pressed out of the pars retinalis iridis. When the circle is more indistinct, changes of the delicate epithelium of the capsule come into consideration. The opacity disappears after a time and leaves behind no trouble.

CHAILLONS and POLACK (569, **Annular opacity of the lens following a contusion of the eyeball**) describe a circular opacity which corresponded to the pupillary margin, was visible when the pupil was dilated, surrounded a transparent portion of the lens, and disappeared, leaving no trace, after a short time.

WOPFNER (570, **A case of metastatic panophthalmitis in an eye which had been operated on for cataract, in consequence of a croupous pneumonia**) describes a case of pneumonia which produced a metastatic panophthalmitis and is of interest bacteriologically, pathologically, and clinically. Five days after an extraction of cataract without iridectomy the sixty-eight-years-old patient was seized with double pneumonia and immediately afterward a metastatic suppuration in the eye which had been operated on. Death occurred in five days. Autopsy confirmed the clinical diagnosis; pneumobacilli were found in the secrétion of the diseased portions of the lungs and also in the pus taken from the vitreous. The case was certainly one of endogenous metastasis, which broke out in the retina, the vessels of which exhibited the characteristic changes with subsequent necrosis and hemorrhages in the tissue, and thence passed to the vitreous. The course shows anew the great tendency of the eye to form metastatic foci in its vascular tissues.

It has been clinically demonstrated that infections are rarer with the Czermak-Fuchs fenestrated dressing than with an occlusion bandage. DE LIETO VOLLARO (571, **Studies concerning the bacteria of the conjunctiva in the postoperative treatment of cataract without occlusion bandage**) finds that the number of colonies is diminished by washing out and rubbing the conjunctival sac with salt solution, and that the mechanical asepsis is to be preferred to the antiseptic washing. Twenty-four hours after the operation more colonies were to be found than before, but less than when an occlusion bandage was used. In other operations the results were still more favorable. On the whole these studies show the advantage

of a simple light dressing without occlusion, such as is generally practised.

VAN DUYSE (572, **Cyanopsia and xantopsia of lenticular origin in the same subject**) reports the case of a patient, fifty-nine years of age, who had blue vision in her aphakic eye after cataract extraction, and yellow vision in the other eye, in which an iridectomy had been performed. The latter, van Duyse ascribes to the yellow color of the lens, while the blue vision, which has also been observed by Enslin after cataract extraction, he thinks due to the perception of the blue rays which had been absorbed by the lens. Both the blue and the yellow vision he holds to be symptoms of peripheral origin, which may be caused either by the action of a yellow subretinal transudate (Berry), or by commencing siderosis bulbi (Bettremieux). In other cases he agrees with other authors that yellow (santonin poisoning), blue, or violet vision is of central origin, to which origin he ascribes all cases of red vision.

BERGER.

While fencing, a student received a blow over the right eye which produced a luxation of the lens. The lens was dislocated upward and rotated about its horizontal axis. On the following day the lens had returned completely to its normal position. POSSEK (573, **Spontaneous reposition of a lens subluxated by traumatism**) thinks that probably some fibres of the zonula were stretched or torn, that a bubble of vitreous entered the space and afterward drew back so as to permit the lens to resume its former position.

XIV.—IRIS.

574. LOBMANN, W. **The typical eccentricity of the lesser circle of the iris, and the relation of the eccentricity of the optic nerve to that of the ora serrata.** *Klin. Monatsbl. f. Augenheilk.*, xliv., 2, p. 68.

575. FROMAGET, C. **Pupillary athetosis or hippus.** *Archives d'opht.*, xxvi., p. 230.

576. GILBERT, W. **Atrophy of pigment and pigmented deposits in the course of iritis.** *Klin. Monatsbl. f. Augenheilkunde*, xlv., 2, p. 91.

577. FRUECHTE, W. **Cysts of the iris and their treatment.** *Klin. Monatsbl. f. Augenheilkunde*, xliv., 2., p. 42.

578. EVERSBUSCH, O. **A casuistic contribution to the study of pseudo-tumors in the eye. Formation of blood cysts.** *Reprint from the Festschrift for J. Rosenthal.* Leipsic, 1906.

579. PECHIN, A. **Special form of tuberculosis of the uveal tract.** *Arch. d'ophtalm.*, xxvi., 8, p. 497.

580. ABADIE. **The indications for iridectomy in irido-choroiditis.** *Annales d'oculistique*, cxxxv., p. 441.

581. DUBAR, LEON. **Incarceration of the iris.** *L'echo médical du Nord*, 1906, p. 267.

In LOHMANN'S (574, **The typical eccentricity of the lesser circle of the iris and the relation of the eccentricity of the optic nerve to that of the ora serrata**) case the iris circle was situated farthest from the pupillary margin below and to the outer side, nearest above and to the inner side. The author found this type of eccentricity in 7% of a series of observations, usually symmetrical, bilateral in 4%, unilateral in 3%. He found a similar condition of the ora serrata, which lies nearer the ciliary body on the nasal side than on the temporal, and in the optic nerve, which shows an increased development laterally. The need of this condition is based on the great development of the retina in the place of the keenest vision. Yet no injury to the peripheral vision results, as we can see almost to the horizontal outward in the visual field. Accurate vision in the periphery does not come practically into consideration, because we are accustomed to fix the object automatically.

FROMAGET (575, **Pupillary athetosis or hippus**) observed in a patient thirty-eight years old, who had a unilateral, congenital, nuclear paralysis of the oculomotorius, a unilateral hippus on the paralyzed side. He finds an analogy between this hippus and the posthemiplegic athetosis of Hammond. The athetosis of the pupil manifests itself through the clinical symptom of hippus (rapid change of the pupillary diameter); the athetosis of the external eye muscles calls forth, on the contrary, the symptoms of nystagmus. BERGER.

GILBERT (576, **Atrophy of pigment and pigmented deposits in the course of iritis**) describes a case of iritis in the course of which an atrophy of the anterior limiting layer took place. The pigment of the destroyed stroma cells escaped into the anterior chamber and became deposited on the capsule of the lens and on the posterior surface of the cornea. These pigment deposits could not well be referred to the ciliary body, because of the formation of posterior synechiæ between the iris and the lens. The case confirms the view expressed by Knies,

Baas, Groenouw, and Harms, that the precipitates on the membrane of Descemet come from the iris. This condition cannot be called characteristic of cyclitis. It must certainly be acknowledged that after irido-cyclitis the precipitates often assume a brownish color when they have been in existence for some time, but this peculiarity has nothing more to do with the condition here mentioned.

Fruechte (577, **Cysts of the iris and their treatment**) reports two cases of serous cysts of the iris and one case of pearl cyst of the iris, with a description of the microscopic condition of the latter. The cysts were due to implantation of epithelium in the iris. The method of implantation was doubtful in this case: the history gave no clue, ciliæ were absent. Perhaps they were epithelia of the skin or cornea, the proliferation due to changed nutritive conditions. The treatment of the pearl cyst is operative, radical; in the other cases opening or transfixion was tried at first in order to conserve the vision and to get good cosmetic results, but the frequent recurrences demonstrated that the operative method was preferable.

The case reported by Eversbusch (578, **A casuistic contribution to the study of pseudo-tumors of the eye**) was that of a woman in whose eye a tumor developed after an injury and repeated slight contusions. The tumor was called by various persons a sarcoma. It arose apparently from the ciliary body. Enucleation was recommended and declined. The affected eye finally diverged; some loops of blood-vessels appeared in the conjunctiva of the globe; the iris became atrophic, partially adherent to the lens; the lens became bluish-white, and to these conditions is to be added the tumor-like formation. With the diaphanoscope it was proven transparent below and to the temporal side, and finally the diagnosis of a blood cyst was made. A cataract and an extravasation of blood into the ciliary body were caused by the traumatism; the extravasation increased in size and was changed into a cyst by further pathological changes. This case shows that in the diagnosis of sarcomata the exclusion of other forms of tumors is necessary, and that for this purpose Lange's test with the diaphanoscope is valuable.

Pechin (579, **Special form of tuberculosis of the uveal tract**) describes the changes in tuberculosis of the cornea, which

consisted of little spots on its posterior surface that were well differentiated from the usual signs of Descemitis. The characteristic symptoms of this type of tuberculosis of the uveal tract are slow development, a tendency to recurrence, and a slight reduction of tension. Dianoux has called attention already to similar forms (sclero-keratitis tuberculosa), and further observations must determine the value of these important symptoms in the diagnosis. BERGER.

ABADIE (580, **The indications for iridectomy in irido-choroiditis**) considers iridectomy indicated in irido-choroiditis when the disease is at a standstill or growing worse, without rendering the general treatment superfluous. Relapses are milder and less dangerous. BERGER.

DUBAR (581, **Incarceration of the iris**) calls the incarceration of the prolapsed iris a very frequent and unpleasant complication of the perforation of the cornea. The indications for treatment are indeterminate—reposition of the iris, cauterization, iridectomy, the latter sometimes the means of help. Little that is new is said in regard to symptoms and diagnosis. The prognosis varies. When nothing else happens, a leucoma adherens is frequently formed, with a change in the form and position of the pupil. The vision adapts itself to the leucoma and the irregular astigmatism caused by it. The attempt may perhaps be made to replace the piece of iris, but the intraocular tension affords an obstacle and the question of infection must not be forgotten. An iridectomy must be broad in order to be certain to relieve the incarceration completely. BERGER.

XV.—CHOROID.

582. SCHMIDT-RIMPLER. **Coloboma of the choroid with coincident so-called pressure excavation of the papilla.** *Muench. med. Wochen.*, 1906, 27.

583. AURAND. **Tuberculosis of the choroid.** *Soc. franç. d'ophtalmol.*, May, 1906. *Revue générale d'ophtalm.*, 1906, 6.

584. ROLLET and AURAND. **Experimental tuberculosis of the choroid in the rabbit.** *Soc. des sc. méd. de Lyon*, 1906, Jan., 17.

585. KALT. **Conjunctival tuberculosis spread to the ciliary body. Generalization of the tuberculosis.** *Arch. d'opht.*, xxvi., 6, p. 384.

586. MONTHUS, A. **Hemorrhages of the ciliary body in the newly born.** *Société d'ophtalmologie de Paris*, March 6, 1906.

587. PURTSCHER, O. **The recognition of sarcoma of the choroid.** *Centralbl. f. prakt. Augenheilkunde*, xxx., p. 139.

588. KNAPP. A. **Report of a case of flat sarcoma of the choroid** *Arch. f. Augenheilkunde*, lv., 3, p. 274.

589. SCHIECK, FR. *The melanosarcoma as the only form of sarcoma of the uveal tract.* Wiesbaden, Bergmann, 1906.

SCHMIDT-RIMPLER (582, **Coloboma of the choroid with coincident so-called pressure excavation of the papilla**) found in a woman fifty-three years of age a bilateral coloboma of the choroid which extended in the right eye to within $\frac{3}{4}$, in the left to within 3 p. d. of the sheath of the optic nerve. The papillæ presented a glaucomatous excavation of from $\frac{1}{2}$ to 1*mm* depth, with good vision and perfect visual fields. Her ten-year-old daughter likewise had a bilateral coloboma of the choroid.

A purulent inflammation of the cervical glands with signs of a chronic irido-choroiditis appeared in a man twenty-two years of age after an affection of the lungs. The course was violent. Vision failed, the eye became inflamed, painful, increased in size, and perforation took place at the end of four months. Enucleation was performed by AURAND (583, **Tuberculosis of the choroid**). A tumor was found in the upper and outer part of the eyeball, which was shown by the histological investigation to have been of tuberculous origin.

BERGER.

ROLLET and AURAND (584, **Experimental tuberculosis of the choroid in the rabbit**) inoculated a rabbit with human tuberculosis material. After five months several foci were found in the choroid, not at the site of inoculation, but in the deeper parts, where the infectious material must have been carried by the blood or the lymph. The stage of caseation could be perceived in some places. This attempt to produce tuberculosis experimentally appears to have succeeded, and therefore is worthy of notice. BERGER.

KALT (585, **Conjunctival tuberculosis spread to the ciliary body**) saw in a girl eighteen years old who suffered from conjunctival tuberculosis, in which the tubercle bacilli had been demonstrated, the disease follow a violent course. Extensive ulcerations were formed, the vitreous became opaque, pain showed the presence of a cyclitis. Pseudo-rheumatic pain followed. Then came an improvement of the ocular symptoms.

After some months pleurisy and pulmonary tuberculosis set in. The course was remarkable in the uselessness of the cauterizations, which always failed, and in the pains, which decreased *pari passu* with the ulcerations. BERGER.

MONTHUS (586, **Hemorrhages of the ciliary body in the newly born**) found, in a child that died shortly after birth, a large hemorrhage in the region of the ciliary body, though there were none of the frequent retinal hemorrhages. The child was the second-born of twins, with prolapse of the umbilical cord. In the discussion which followed the reading of the paper, Terrien mentioned that he had demonstrated microscopically an extensive hemorrhage in the layer of large vessels of the choroid in a newly born infant. BERGER.

In the case described by PURTSCHER (587, **The recognition of sarcoma of the choroid**) the question was one of differential diagnosis between glaucoma and sarcoma of the choroid. There were a number of anterior synechiæ and a collection of material resembling coffee grounds in the anterior chamber. A protrusion of the retina could be made out through the cloudy vitreous. Tension was plus. Movements of the hand close to the eyes could be made out uncertainly, projection was bad. In order to confirm the diagnosis, the anterior chamber was opened with a Graefe knife and the brownish mass mixed with aqueous evacuated and examined. In addition to blood corpuscles the fluid contained irregular lumps of yellowish brown to dark brown pigment. This rendered the diagnosis of sarcoma certain, which was fully confirmed by the examination of the enucleated eye. This condition, in which tumor elements from a circumpapillary sarcoma wander into the anterior portion of the globe, is rare. One similar case has been reported in which metastases of pigment were found in parts situated at a distance from the sarcoma.

KNAPP (588, **Report of a case of flat sarcoma of the choroid**) reports the case of a patient twenty-eight years of age, who had at first a brown swelling behind the iris. Enucleation was refused, but was performed later when glaucoma supervened. The patient died from metastases of the sarcoma a year and a half after the commencement of the disease. The flat tumor, which was examined microscopically, had developed in the lymph spaces of the suprachoroidea. Vessels were absent.

The metastases took place in the skin and bones. The tendency of the eye to the formation of sarcoma appears noteworthy.

SCHIECK (589, **The melanosarcoma as the only form of sarcoma of the uveal tract**) says that the pathological representation of melanosarcoma of the uveal tract shows a great variety—uncolored and colored round-cell, spindle-cell sarcomas, sarcomas with epithelioid forms of cells, others with angiosarcomatous, alveolar, and gliomatous construction. The pigment varies greatly—granular, globular, associated with degeneration, reacting or not to the iron test. Yet in spite of all these varieties the origin is everywhere the same, always in the proliferation of the pigmented stroma cells (chromatophores). The latter go through their stages of development from the uncolored embryonal round cell to the physiological pigment cell of the ripe melanosarcoma. The pictures elucidate these stages graphically. The relation of the pigment cells to the vessels, their arrangement along the latter, gives the condition for their nutrition and so the proliferation of these cells. Faulty nutrition is then still further the starting-point of many degenerative processes, necrosis, metastatic formations, etc. In the third part of this work the author answers several as yet unsettled questions, as, for example, that the leucosarcoma is always to be considered as belonging to the group of melanosarcoma, as well as the greatest part of the angiosarcomata. Finally the author comes to the conclusion that in the uveal tract melanosarcomata alone occur and that primary sarcomata of other kinds have not been positively determined as such. The knowledge of tumors in the light of modern science must lead to such a unification of the different forms of sarcoma of the uveal tract.

XVI.—VITREOUS.

590. OGAWA, K. **Experimental studies of wounds of the vitreous.** *Arch. f. Augenheilkunde*, lv., 1-2, p. 91.

OGAWA (590, **Experimental studies of wounds of the vitreous**) has shown experimentally on the eyes of rabbits, in which he had injured the vitreous by means of a Graefe knife introduced under aseptic precautions, that the wounds cause

separations in the tissue which do not close again or cicatrize. Leucocytes found in and about the wound come from the penetrated membranes or the iris and gradually disappear. These conditions are of particular interest because any penetrating wound of the eye that reaches the vitreous affords an opportunity for infection, but an infection of the vitreous, the peculiar composition of which affords a nutritive material for bacteria, can readily lead to panophthalmitis.

XVII.—GLAUCOMA.

591. MASLENIKOW. **The variations in the ocular tension during the course of glaucoma.** *Westn. Ophthalm.*, 1905, 3. *Rev. gén. d'opht.*, 1906, 6.

592. TRUC, H., IMBERT, A., and MARQUES, H. **Treatment of glaucoma by high-frequency currents.** *Revue gén. d'ophtalmologie*, XXV., p. 337.

593. LAGRANGE, F. **Combined iridectomy and sclerectomy in the treatment of chronic glaucoma.** *Arch. d'ophtalm.*, XXVI., 8, p. 481.

594. ADAMUECK, K. **Treatment of glaucoma.** *Westn. Ophth.*, 1906, No. 3.

595. MICHELSOHN-RABINOWITSCH, MRS. C. **Contribution to the study of congenital hydrophthalmos.** *Arch. f. Augenheilkunde*, lv., 3, p. 245.

596. PICK. **Some ophthalmological observations. A case of congenital hydrophthalmos cured by sclerotomy.** *Centralbl. f. prakt Augenheilk.*, XXV., p. 178.

MASLENIKOW (591, **The variations in the ocular tension during the course of glaucoma**) ascertained with the tonometer that in glaucoma the tension is greater in the morning than in the evening, the difference amounting to more than 6*mm* of mercury in comparison with 2.5 in the normal eye. During the use of myotics (eserin) the increase in the morning is not so marked, but it is present even after iridectomy and is therefore characteristic of glaucoma.

TRUC, IMBERT, and MARQUES (592, **Treatment of glaucoma by high-frequency currents**) observed in a man fifty years of age a subacute glaucoma of the left eye with small hemorrhages in the macula and in the retina about the papilla. The vision had fallen to $\frac{1}{50}$. In spite of the local use of a 2% solution of pilocarpin and general treatment the vision continued to fail, so Truc performed an iridectomy. No improvement of the tension, which was +2, was obtained, light could

no longer be perceived, and increased tension, +1, appeared in the right eye, which still maintained normal vision. D'Arsonval's current was now applied, with the result that the tension of the vessels, measured by Potain's apparatus, was reduced from 27½ or 28 to 17½, the normal being 14, while at the same time the vision of the left eye improved so that fingers could be counted at the distance of several metres. The authors emphasize the importance of an investigation of the vascular tension with the sphygmomanometer, and consider the use of the high-frequency current indicated when an increase of the vascular pressure has been demonstrated in glaucoma. BERGER.

LAGRANGE (593, **Combined iridectomy and sclerectomy in the treatment of chronic glaucoma**) has performed a new combined operation on twenty patients with chronic glaucoma, and obtained good results. He makes a curved incision in the sclera concentric to the margin of the cornea and performs an iridectomy through this wound. The course of the operation is elucidated by five illustrations. The tension is promptly and permanently reduced, prolapse of the iris is avoided, and the cicatrization beneath the conjunctival flap offers many advantages. BERGER.

ADAMUECK (594, **Treatment of glaucoma**) has observed numerous cases of glaucoma in which the vision has remained good for years under the influence of myotics without iridectomy. On the other hand, he has seen atrophy of the optic nerve develop with complete absence of glaucomatous symptoms in 10% of all cases in which iridectomy was performed for glaucoma. Iridectomy for glaucoma also seems to predispose to the formation of cataract. He therefore holds that iridectomy should not be performed as a prophylactic measure, nor immediately upon the first attack of glaucoma. In these cases the disease should be combated with myotics, and iridectomy performed only when these have failed. He does not consider the so-called glaucoma simplex to be glaucoma.

HIRSCHMANN.

The cause of congenital hydrophthalmos is still uncertain. It is not incorrect to assume an interference with the escape of the intraocular fluid from the angle of the anterior chamber.

At any rate the anatomical process is conceivably very manifold which is clinically designated as hydrophthalmos. Chronic uveitis, cyclitis, inflammation in Schlemm's canal, or arrest of development may cause this interference with the escape of the fluid. MICHELSOHN-RABINOWITSCH (595, **Contribution to the study of congenital hydrophthalmos**) examined a case of congenital hydrophthalmos which was interesting in many ways. Enucleation was performed in a child one and one-fourth years old in whom the first signs of glaucoma had appeared during the second month. Iridectomy had been performed early. Together with this congenital anomaly there was a peculiar swelling of the lids and of the temporal region. The pathological examination of the eyeball revealed a peripheral anterior synechia on the nasal side in the anterior chamber with no signs of previous inflammation, while on the temporal side the ligamentum pectinatum alone was changed without obstruction to the filtration angle. On the nasal side Schlemm's canal was absent, on the temporal side noticeably contracted. Only a general hyperæmia was present, with no signs of inflammation or accumulations of round cells. There was a proliferation of the perineurium of the ciliary nerves, and to a less degree of the endoneurium. The author connects the pathological conditions, particularly the felting of the pectinate ligament and the fibromatous changes of the ciliary nerves, with the peculiar swellings in the face, which resemble elephantiasis. Similar cases in which the pathology of the disease was likewise connected with elephantiasis or hypertrophy of the skin have been described by Sachsalber, Lezius, and others. The case affords a valuable contribution to the explanation of congenital hydrophthalmos.

PICK (596, **A case of congenital hydrophthalmos cured by sclerotomy**) performed anterior sclerotomy on account of bad vision, signs of glaucoma, and pain in a patient sixteen years of age in whom bilateral iridectomy had been performed during his second year on account of congenital hydrophthalmos. His explanation of the improvement which he obtained in both eyes is that the wounds in the sclera remained open, or formed a cystoid cicatrix. This result is obtained by the position of the incision and by massage. Schoen reported a similar case in 1905.

XVIII.—SYMPATHETIC OPHTHALMIA.

597. ROEMER, PAUL. **Studies in sympathetic ophthalmia. Fourth article.** *Arch. f. Augenheilkunde*, lv., 4, p. 313.

ROEMER (597, **Studies in sympathetic ophthalmia**) is led by his experiments and observations to let drop the ciliary-nerve theory, because an inflammatory irritation in one eye does not influence in a reflex manner the secretion in the other eye. He likewise abandons the migration theory of Leber and Deutschmann and gives his reasons. He considers the disease to be a true metastasis as already pronounced by Berlin, and furnishes evidence in favor of this hypothesis in his accurate and extensive experiments. Schirmer has studied the subject for a long time and the amount of his investigations, from a clinical standpoint, is that sympathetic ophthalmia is infectious and that the bacteria come from the injured eye. Roemer goes farther in that he seeks to confirm the clinical results experimentally. He takes the blood current to be the means by which the bacteria are conveyed to the second eye. Berlin formerly suggested this, but the thought was not farther carried out. This explanation, transmission through the blood current, seems most natural from analogy with other diseases which have a tendency to metastasis. The diseased material goes from the injured eye into the blood, can be deposited in other organs; germs can enter the iris and ciliary body of the other eye. The infection of the blood from the wound and the rapidity of its transportation are discussed. The experiments are illustrated. The infectious material was injected directly into the vitreous of rabbits through a heated canula passed through the cornea and lens.

Sections XIX.–XXII. Reviewed by DR. H. MEYER, Brandenburg.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

598. SACHS. **Spontaneous pulsation of an atypical vorticose vein situated near the macula.** *Zeitschrift f. Augenheilkunde*, xv., p. 532.

599. VON HIPPEL, EUGEN. **Spontaneous formation of an aperture in the fovea centralis.** *Arch. f. Ophthalmologie*, lxiv., p. 172

600. REIS, W. **Etiology and genesis of formation of apertures in the macula lutea (retinitis atrophicans centralis).** *Zeitschrift f. Augenheilkunde*, xv., p. 37.

601. DEUTSCHMANN, R. **Operative treatment of detachment of the retina.** *Klin. Monatsbl. f. Augenheilkunde*, xliv., 1, p. 364.

602. v. HIPPEL, EUGEN. **Pathological conditions in rare diseases of the retina.** *Arch. f. Ophthalm.*, lxiv., p. 157.

The pulsation of the atypical vorticose vein near the macula in a myopic eye described by SACHS (598, **Spontaneous pulsation of an atypical vorticose vein situated near the macula**), was caused by a dilatation of the intrascleral portion of the vein due to the myopic process. The anatomical conditions which prevent pulsation in the normal vorticose veins were annulled in this case by the myopia.

In confirmation of Reis's view concerning the origin of formation of "holes" in the region of the macula, v. HIPPEL (599, **Spontaneous formation of an aperture in the fovea centralis**) reports a case which was examined anatomically, though unfortunately not observed clinically because of opacities in the vitreous. There was a considerable degree of œdema of the retina, confined exclusively to the region of the macula, that diminished as it receded from the margins of the fovea, but in the fovea itself formed a large cavity filled with fluid, which was separated from the vitreous only by the limitans and was bounded externally by a very thin layer of newly formed glia tissue.

REIS (600, **Etiology and genesis of formation of apertures in the macula lutea**) reports four cases observed by himself of formation of "holes" in the macula in consequence of retinitis albuminurica and of traumatism. He claims that this formation is the result of a central œdema of the retina, the presence of which in retinitis albuminurica has been shown by Greeff. In traumatism it is the consequence of Berlin's cloudiness, likewise an œdema.

Referring to Wernicke's work on clinical and experimental contributions to operative treatment of detachment of the retina, DEUTSCHMANN (601, **Operative treatment of detachment of the retina**) points out the difference between experiments on the normal eyes of animals and the conditions which present themselves in detachment of the retina. He asserts in contradiction to Wernicke that injection of the vitreous of animals is without danger if his directions are observed. Besides he would use the injections only on eyes which had re-

sisted every other form of treatment. The percentages taken by Wernicke from the literature are so high because the surgical intervention in this disease appertains to modern times.

v. Hippel (602, **Pathological conditions in rare diseases of the retina**) reports the anatomical examination of two eyes which had been enucleated on account of rare diseases of the retina. The first was one of glaucoma with retinal detachment due to shrinkage of the retina. The shrinkage had taken place after the retina had attained an abnormal size due to a fibrinous exudate into it. Cysts were also present. Two similar cases have been mentioned by Parsons and De Schweinitz and Shumway. The second case was one of disease of the retinal vessels from an unknown basis, with secondary hemorrhages beneath the retina and in the vitreous, which had been followed by formation of tissue as in retinitis proliferans. In addition there was an infiltration of lymphocytes of the choroid which corresponded to the sites of the hemorrhages. Whether this is similar to the sympathizing uveitis is doubtful.

XX.—OPTIC NERVE.

603. Voigt, W. **Tobacco and alcohol amblyopia.** *Inaug. Dissert.*, Giessen, 1906.

604. Galezowski, Jean, and Lobel, A. **Tabetic optic atrophy and central scotoma.** *Recueil d'ophtalmologie*, xxviii., p. 193.

Voigt (603, **Tobacco and alcohol amblyopia**) has grouped the principal symptoms of alcohol and tobacco amblyopia on the basis of sixteen cases. Disturbances of digestion are made specially prominent etiologically, and nyctalopia as marked among the clinical symptoms. The rarity of peripheral contractions of the visual field is remarked. All attempts to obtain positive points for differential diagnosis between alcohol and tobacco amblyopia from the clinical symptoms or the ophthalmoscopic appearances, must be considered as unsettled.

Jean Galezowski and Lobel (604, **Tabetic optic atrophy**) have observed six cases of central scotoma in tabetic optic atrophy, a symptom pronounced by Panas to be extremely rare, as he observed one case himself and was able to find only three others recorded in literature. In two of the cases reported by Galezowski and Lobel the central scotoma appeared

to be called forth by intoxication, in one case by aniline colors, in the remaining four cases the tabes had no complication. In these latter cases the central scotoma was accompanied by a peripheral contraction of the field. The explanation of these cases offered by the authors is the involvement of the papillo-macular bundles of fibres in consequence of extension of the disease from the periphery toward the axis of the optic nerve (inflammation of the pia mater with vascular disease: endo- and peri-phlebitis and hypertrophy of the connective tissue).

XXI.—INJURIES, FOREIGN BODIES, PARASITES.

605. LUNDSGAARD, K. **Two cases of injury to the eye by an electric short circuit.** *Klin. Monatsbl. f. prakt. Augenheilk.*, xliv., 1, p. 501.

606. GRAEFENBERG, ERNST. **Contribution to the casuistics of iron cataract.** *Arch. f. Augenheilkunde*, lv., p. 282.

607. KREUZBERG. **Some observations in regard to injuries of the eye by fragments of iron.** *Centralbl. f. Augenheilkunde*, xxx., p. 172.

608. KUHNT, HERMANN. **Treatment of fresh, complicated penetrating wounds of the cornea.** *Zeitschrift f. Augenheilkunde*, xv., p. 312.

609. ASMUS, E. **Traumatic late detachment of the retina.** *Zeitschr. f. Augenheilkunde*, xv., p. 444.

610. LIEBRECHT. **Fracture of the skull and the eye.** *Arch. f. Augenh.*, lv., p. 36.

611. HIRSCHBERG, J. **A rare injury to the orbit.** *Centralbl. f. Augenheilkunde*, xxx., p. 101.

LUNDSGAARD (605, **Two cases of injury to the eye by an electric short circuit**) reports two cases of injury by the current of 550 volts used on the electric street railway in Copenhagen. In one a detachment of the retina was present five months after the shock which the author thinks was the direct result of the injury to the choroid. In the other there were keratitic disturbances which he does not consider to be due wholly to the burning.

In GRAEFENBERG'S (606, **Iron cataract**) iron cataract there was found the usual smutty green discoloration of the iris and large brown spots on the lens directly behind the margin of the pupil. The rim of the spot on the lens did not extend beyond the pupillary margin of the iris. The ferrocyanide of potassium-hydrochloric acid test gave a positive result.

KREUZBERG (607, **Injuries of the eye by fragments of iron**) reports an injury to the orbit by a piece of iron 14*mm* long,

which was removed by means of Hirschberg's magnet, and another case in which the lens was injured by a very small fragment, but very little optic disturbance was produced (posterior polar cataract).

KUHNT (608, **Treatment of fresh, complicated, penetrating wounds of the cornea**) recommends, in order to obtain a quick closure of the wound in penetrating injuries of the cornea and lens, to perform iridectomy and to cleanse the margins of the wound, and then to cover the corneal wound by a flap from the conjunctiva with a double pedicle. He thinks this method should be tested.

Induced by the publication of PFALZ, ASMUS (609, **Traumatic late detachment of the retina**) reports a case of detachment of the retina which was observed a year and three quarters after the receipt of the traumatism. The author is uncertain whether this was not a case of faulty observation on the part of the patient, who did not notice the detachment until it had become very extensive.

LIEBRECHT (610, **Fracture of the skull and the eye**) made the following observations on 100 cases of fracture of the skull admitted to the hospital at Hamburg. 26% were fatal. The fever was proportional to the severity of the brain symptoms. In 6% a striped cloudiness of the papilla appeared, which the author ascribes to fatty degeneration of the glia cells; in 5% the papilla was swollen. Bilateral absolute loss of the reflex of the pupil to light was present only in very serious cases, but it was greatly reduced in 15%. In 14% there were disturbances in the region of the facial nerve. One case had total ophthalmoplegia. Hemorrhage into the lids and conjunctiva is the most frequent and diagnostically the most important symptom. In 55% of the pathological examinations, hemorrhages into the sheath of the optic nerve were observed and special stress is laid on the seat of the hemorrhage. In many cases the blood oozed through the interstitial spaces of the sheath from the cavity of the skull; in other cases the blood pressed forward in the lymph space of the ophthalmic artery, then in the dural sheath and the subdural lymph space; but usually the blood came from lacerated vessels in the intermediate sheath space. Together with hemorrhages in the optic nerve there were in most cases hemorrhages in the septa of

the orbital fatty tissue in the region of the canal. The hemorrhages in the septa of the orbital fatty tissue below the muscles then penetrated forward between the insertions of the muscles through the openings of the septum orbitale beneath the conjunctiva.

HIRSCHBERG (611, **A rare injury to the orbit**) treated a case of injury to the optic nerve by a fragment of iron, in which retinal cloudiness from laceration of the choroid and marked disturbance of vision, with later permanent insular defect of the visual field and paleness of the macular portion of the papilla, were to be observed. In addition there was paralysis of the sphincter, and diplopia due to paralysis of the oculomotorius and abducens, the latter caused by hemorrhages. In order to avoid danger of tetanus infection from the foreign body this was removed by means of a magnet.

XXII.—OCULAR DISTURBANCES IN GENERAL DISEASE.

612. WRIGHT, J. W. **Inflammation of the eyes due to infection from hay-fever conveyed by tobacco smoke, with report of cases.** *Annals of Ophthalmology*, April, 1906.

613. PORTER, E. H. **A case of acromegalia with interesting eye symptoms.** *Ophthalmic Record*, June, 1906.

614. SEELIGSOHN, W. **A case of pseudoleucæmic tumors of the orbit.** *Centralbl. f. Augenheilkunde*, xxx., p. 161.

615. STOCK, W. **Changes in the eye in leucæmia and pseudoleucæmia.** *Klin. Monatsbl. f. Augenheilkunde*, xliv., 1, p. 328.

616. MARX, HERMANN. **Pathological anatomy of the changes in the eye in morbus maculosus Werlhofii.** *Arch. f. Ophth.*, lxiv., 1, p. 175.

617. GALLUS, E. **Hypermetropia and diabetes mellitus.** *Zeitschrift f. Augenheilkunde*, xv., p. 319.

618. PATRY, ANDRE. **Contribution to the study of the ocular lesions in malformations of the skull, with especial reference to oxycephaly.** Paris, G. Jacques, 1905. 123 pages with 8 illustrations.

619. BEAL, RAYMOND. **Retinal hemorrhages in compression of the thorax.** *Annales d'oculistique*, cxxxv., p. 353.

620. LINDENMEYER. **Retrobulbar neuritis after a burn of the skin.** *Klin. Monatsbl. f. Augenheilkunde*, xliv., 1, p. 495.

621. VENNEMAN. **The senile eye and the arteriosclerotic eye.** *Annal. d'oculistique*, cxxxv., p. 459.

WRIGHT (612, **Hay-fever**) observed a number of cases of conjunctivitis occurring in members of a family during the annual attack of hay-fever of the father, who was in th

habit of exhaling tobacco smoke through the nostrils. Wright thinks that the infection was conveyed by this means to the conjunctivæ of the other individuals. The proof is hardly sufficient to refute the commonly accepted view of the non-transmissibility of hay-fever. ALLING.

The case described by PORTER (613, **Acromegalia with eye symptoms**) showed exophthalmos, sluggish pupils, and divergent strabismus. V. O. D., $\frac{6}{30}$; V. O. S., absolute blindness. The disk in the left eye was atrophic, arteries small, reduced to threads, and veins about one-half natural size. In the right eye there was acute neuro-retinitis, with minute splashes of silver lustre in the region of the macula. Disk gray and swollen, with outlines obscure, arteries small, veins enlarged. The field is reported as contracted, but no mention is made of any peculiarities in its form which would have any significance as indicating pressure on the chiasm. ALLING.

SEELIGSOHN (614, **Pseudo-leucæmic tumors of the orbit**) had a patient under observation who developed an acute nephritis after angina. It was associated with headache, choked disk in both eyes, cyclitis, and exophthalmos. A transient swelling of the liver appeared later. The nephritis and cyclitis were certainly caused by toxins, the exophthalmos by pseudo-leucæmic tumors which filled the orbits and disappeared under the influence of Fowler's solution. Whether a leucæmia will come later from the pseudo-leucæmia is an open question.

After a general consideration of the different kinds of leucæmia, STOCK (615, **Changes in the eye in leucæmia and pseudo-leucæmia**) portrays the fundus changes which are to be met with in that disease, with special emphasis on the venous hyperæmia. The bright color of the fundus, which Schmidt-Rimpler and Meller ascribed to reduction of the quantity of hæmoglobin, Stock explains by a thickening of the choroid about the papilla by a heaping up of leucocytes. In one case of acute leucæmia the choroid was entirely occupied by staphylococci; in a case of pseudo-leucæmia there was an infiltration of the entire orbit and a very marked increase of the lymphocytes. An interesting condition accidentally met with by Stock was a true leucocytosis in a rabbit.

Both eyes of a patient dead of morbus maculosus Werlhofii

were examined anatomically by MARX (616, **Pathological anatomy of the changes in the eye in morbus maculosus Werlhofii**) who found œdema of the retina, with little foci of "varicose nerve fibres," numerous hemorrhages, and cellular infiltrations. Hemorrhages and accumulations of round cells were likewise present in the nerves and muscles of the eyes. The blood-vessels were not affected, and Marx considers the cause of the disease to be in all probability microbes or their toxins.

GALLUS (617, **Hypermetropia and diabetes mellitus**) reports the case of a patient who developed an increase of two dioptres of hypermetropia during diabetes. He calls attention to similar observations on the part of Horner, Cohn, Doyne, and Alexander, and conjectures that the diabetes causes a change in the radius of the cornea.

PATRY (618, **Ocular lesions in malformations of the skull**) describes ten cases of post-neuritic optic atrophy which he had observed in oxycephaly, and has collated from literature 54 analogous cases. Associated symptoms with the disease of the optic nerve are headache, convulsions, defective intelligence, exophthalmos, divergent and convergent strabismus, other disturbances of the ocular muscles, ptosis, and nystagmus. He believes, with Virchow and Hirschberg, that a chronic meningitis of unknown origin starts the premature synostosis of the cranial bones and the optic-nerve trouble. He bases this theory on the pathological changes in the coronary and sagittal sutures in 30 cases of oxycephaly examined by Hanotte. In six cases of oxycephaly Patry found no optic atrophy, but retinitis pigmentosa, zonular cataract, and high myopia, in one case a normal fundus. BERGER.

BEAL (619, **Retinal hemorrhage in compression of the thorax**) reports the case of a man forty-nine years of age whose thorax was compressed in a collision between two wagons loaded with stones. The compression caused cyanosis, exophthalmos, tumefaction of the face, and a hemorrhage in the macula of one eye. There was a commencing atrophy of the optic nerve in both eyes and a spot of old choroiditis in the left. The latter, Beal ascribes to syphilis, and he thinks that the existing syphilitic disease of the vessels of the optic nerve was aggravated by the traumatism, and that this resulted in the commencement of the optic atrophy. BERGER.

LINDENMEYER (620. **Retrobulbar neuritis after a burn**) reports a case in which, two or three weeks after an extensive burn of the hands and forearms, retinal or peripapillary hemorrhages took place and the vision fell to counting fingers at one metre, to rise again at the end of four weeks to $\frac{1}{15}$ and $\frac{1}{30}$. Taking into account the few cases reported by Mooren, Knies, and Wagenmann, the author discusses the three theories in regard to the cause of death from extensive burns, those of disintegration of the blood, autointoxication, and intoxication, and decides in favor of the last. Opposed to the theory of the disintegration of the blood are the facts that after acute hemorrhages the failure of vision comes on immediately, while in these cases it first appears after the lapse of some weeks. Unfortunately the blood was not examined in this case.

According to VENNEMAN (621, **The senile and the arteriosclerotic eye**), arteriosclerosis of the eye has nothing in common with the senile changes. In senility the tissue of the muscles, nerves, and glands becomes atrophic, succulent trabecular tissue is replaced by connective, muscular tissue by elastic fibres. The iris of the senile eye is atrophic, its anterior surface less clear, its vessels thickened and showing hyaline degeneration. In arteriosclerosis there is ischæmia of the vessels and a narrowing of their lumen by endarteritis. There is fatty degeneration of their walls, with deposits of cholestearin within them, and hemorrhages from the capillaries. Arteriosclerosis may be either diffuse or circumscribed. When the diffuse form appears simultaneously in the eye and in the kidneys retinitis albuminurica is produced. If diffuse arteriosclerosis appears simultaneously in the eye and in the brain or in the heart, embolism or thrombosis of the central artery of the retina may occur. The simultaneous occurrence of the same process in the eye and the liver may produce an atrophic choroiditis. Thrombosis of the central vein is only a complication of acute endophlebitis, and the author compares this with phlegmasia alba dolens. Circumscribed arteriosclerosis does not occur in so small vessels as the central artery of the retina. Syphilitic and tuberculous arteritis are very similar anatomically to arteriosclerosis, but must be differentiated from it.

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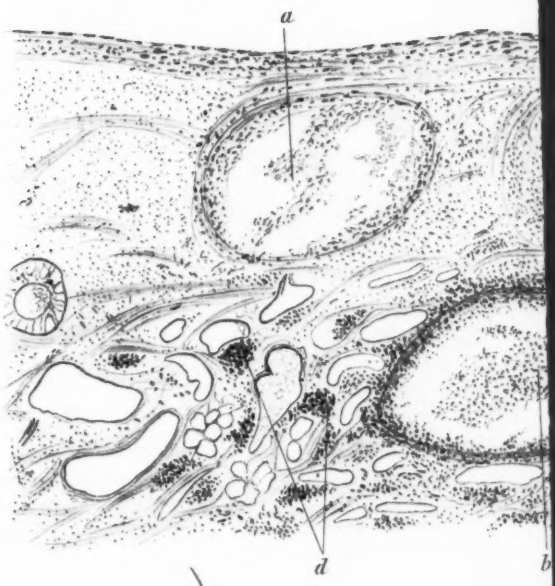

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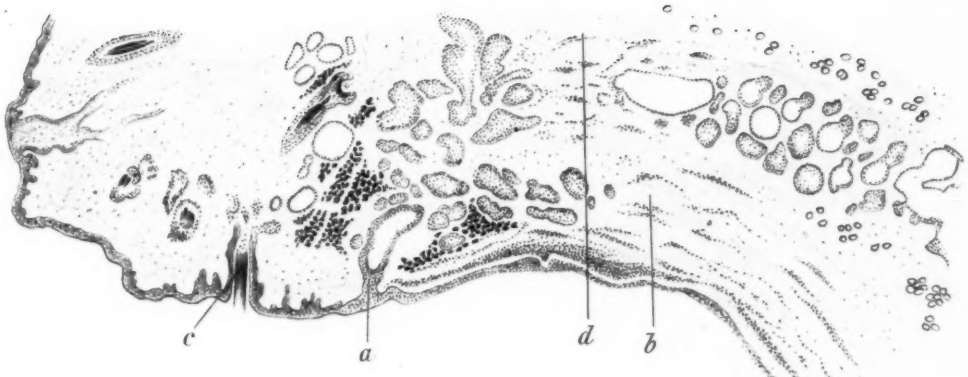

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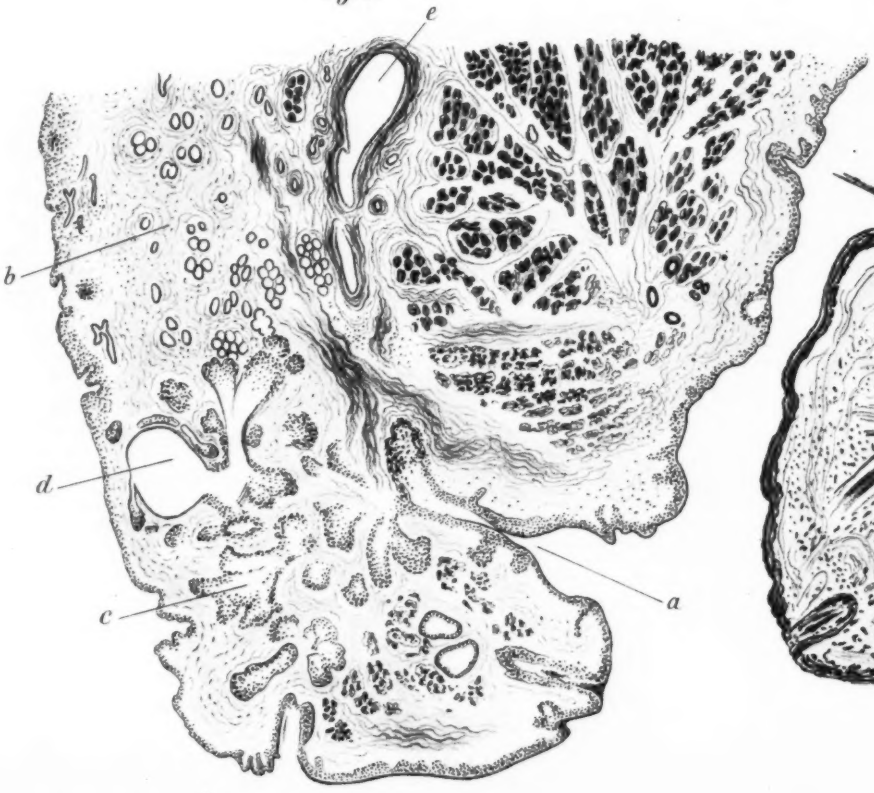

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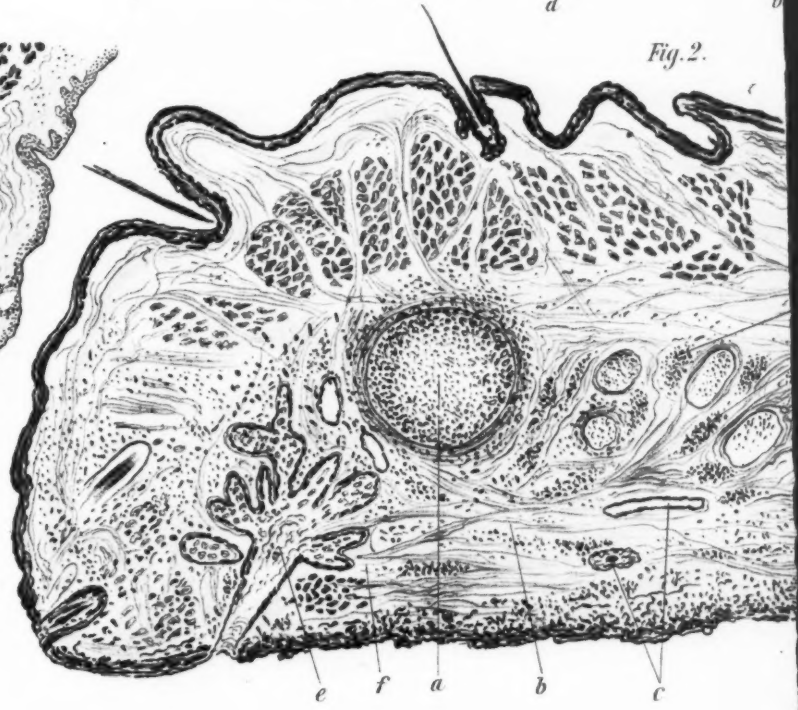

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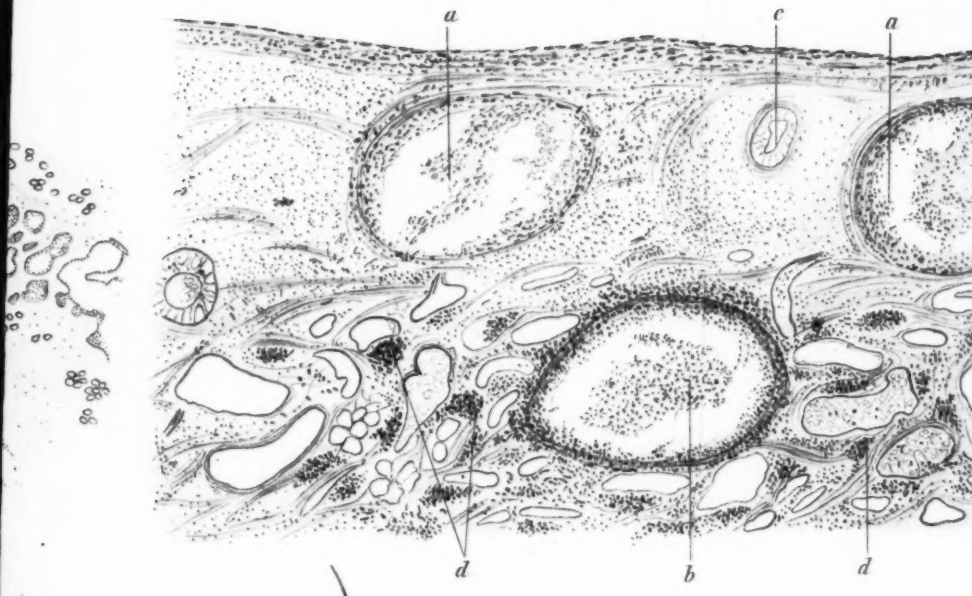

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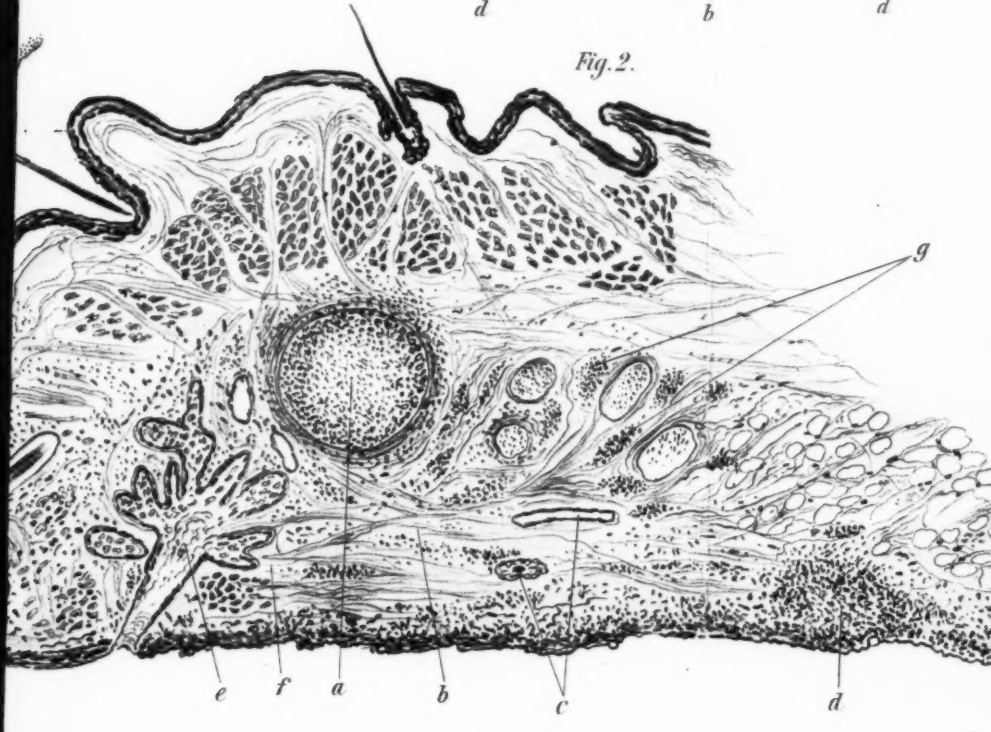

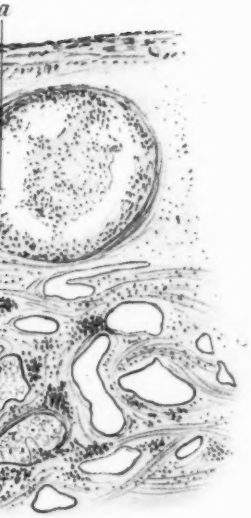

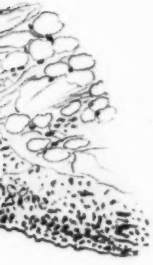

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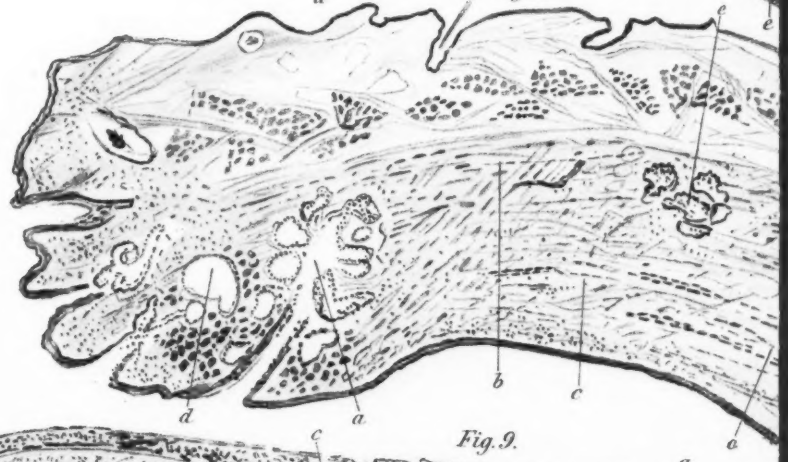

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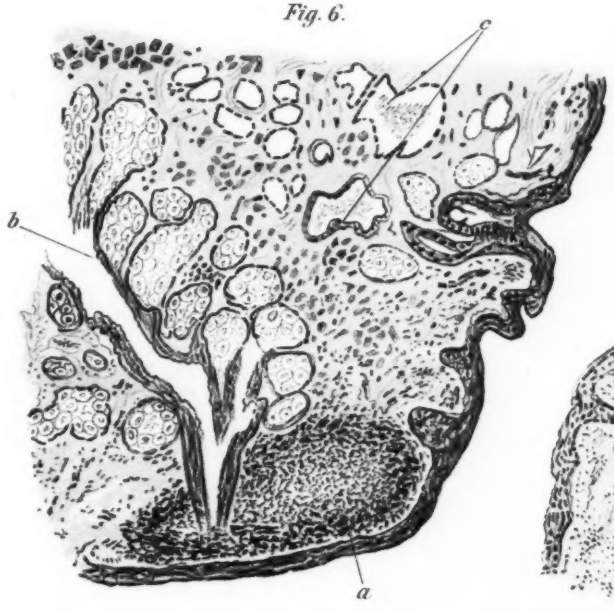

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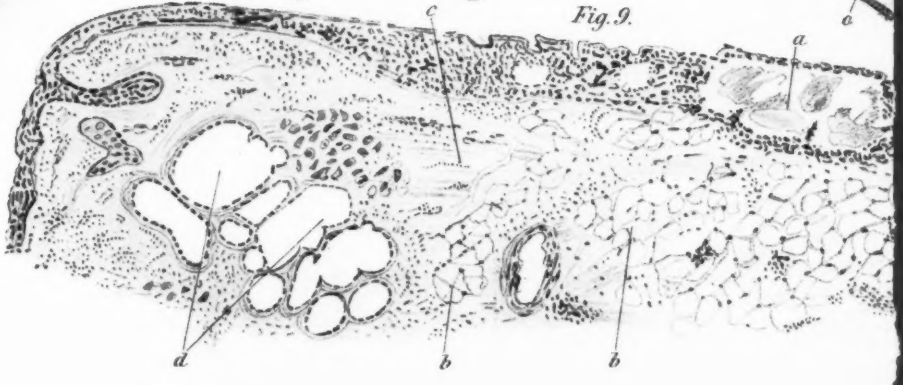

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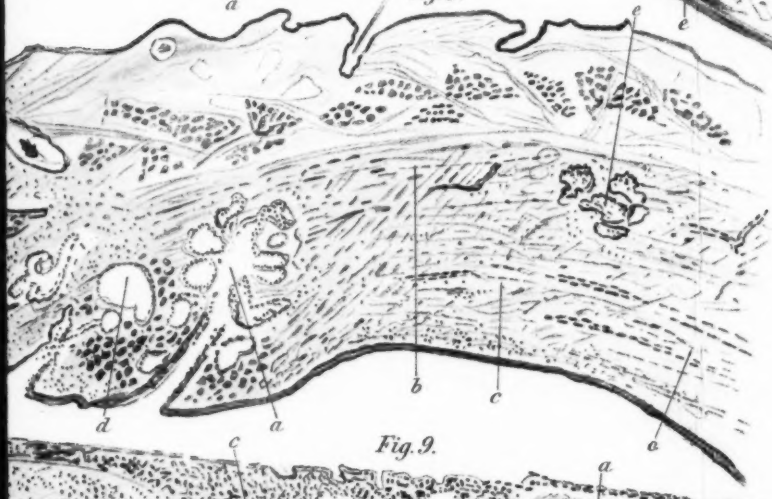

Fig. 9.

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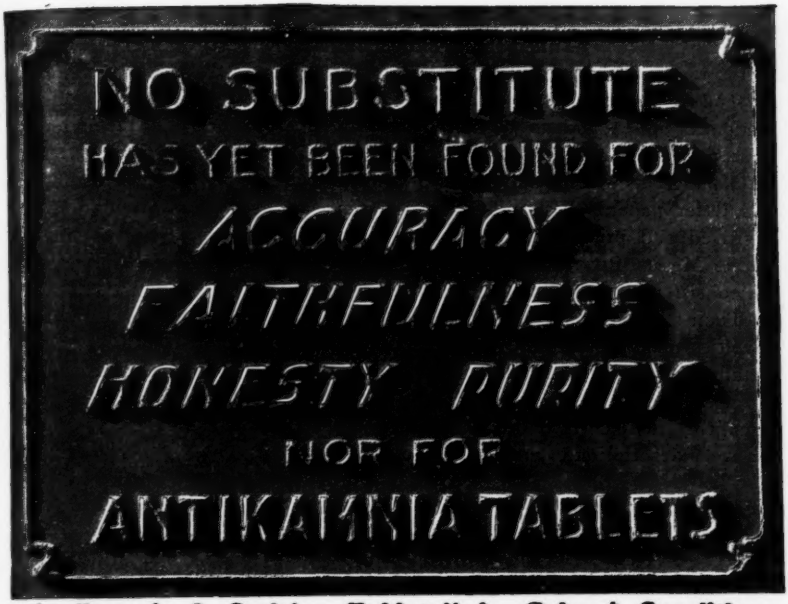

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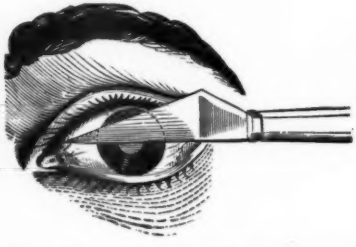

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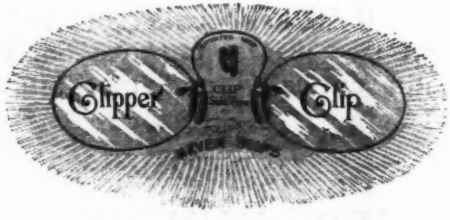

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